

**SEARCH REQUEST FORM**

Scientific and Technical Information Center

Requester's Full Name: WILLIAM G. WRIGHT Examiner #: 62400 Date: 5/14/03  
 Art Unit: 1754 Phone Number 30 5-7792 Serial Number: 09/805/203  
 Mail Box and Bldg/Room Location: \_\_\_\_\_ Results Format Preferred (circle): PAPER DISK E-MAIL

**If more than one search is submitted, please prioritize searches in order of need.**

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: See File

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Point of Contact:  
Toby Port  
Technical Info. Specialist  
CM1 6A04  
703-308-3634

**STAFF USE ONLY****Type of Search:****Vendors and cost where applicable**

|  |                       |                           |
|--|-----------------------|---------------------------|
| Searcher: _____                        | NA Sequence (#) _____ | STN <u>681 + 30 = 711</u> |
| Searcher Phone #: _____                | AA Sequence (#) _____ | Dialog _____              |
| Searcher Location: _____               | Structure (#) _____   | Questel/Orbit _____       |
| Date Searcher Picked Up: <u>5/14</u>   | Bibliographic _____   | Dr.Link _____             |
| Date Completed: <u>5/16</u>            | Litigation _____      | Lexis/Nexis _____         |
| Searcher Prep & Review Time: <u>30</u> | Fulltext _____        | Sequence Systems _____    |
| Clerical Prep Time: _____              | Patent Family _____   | WWW/Internet _____        |
| Online Time: <u>140</u>                | Other _____           | Other (specify) _____     |

=> file reg; d ide 14; d ide 15; d ide 16; d ide 17; d ide 18  
FILE 'REGISTRY' ENTERED AT 14:55:55 ON 15 MAY 2003  
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Property values tagged with IC are from the ZIC/VINITI data file  
provided by InfoChem.

STRUCTURE FILE UPDATES: 14 MAY 2003 HIGHEST RN 515808-31-8  
DICTIONARY FILE UPDATES: 14 MAY 2003 HIGHEST RN 515808-31-8

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 6, 2003

Please note that search-term pricing does apply when  
conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. See HELP  
PROPERTIES for more information. See STNote 27, Searching Properties  
in the CAS Registry File, for complete details:  
<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

L4 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2003 ACS

RN 7440-18-8 REGISTRY

CN **Ruthenium (8CI, 9CI)** (CA INDEX NAME)

OTHER NAMES:

CN Ru-Al

CN Ruthenium black

CN Ruthenium element

DR 57572-01-7, 100041-48-3

MF Ru

CI COM

LC STN Files: ADISNEWS, AGRICOLA, ANABSTR, AQUIRE, BIOBUSINESS, BIOSIS,  
BIOTECHNO, CA, CABA, CANCERLIT, CAOLD, CAPLUS, CASREACT, CBNB, CEN,  
CHEMCATS, CHEMINFORMRX, CHEMLIST, CIN, CSCHEM, CSNB, DDFU, DETHERM\*,  
DRUGU, EMBASE, ENCOMPLIT, ENCOMPLIT2, ENCOMPPAT, ENCOMPPAT2, IFICDB,  
IFIPAT, IFIUDB, MEDLINE, MRCK\*, MSDS-OHS, NIOSHTIC, PIRA, PROMT,  
TOXCENTER, TULSA, USPAT2, USPATFULL, VTB

(\*File contains numerically searchable property data)

Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*

(\*\*Enter CHEMLIST File for up-to-date regulatory information)

Ru

28096 REFERENCES IN FILE CA (1957 TO DATE)

3690 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

28163 REFERENCES IN FILE CAPLUS (1957 TO DATE)

1 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

L5 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2003 ACS

RN 7440-05-3 REGISTRY

CN **Palladium (8CI, 9CI)** (CA INDEX NAME)

## •OTHER NAMES:

CN E 1010/W  
CN MPP 030  
CN MPP 050  
CN MPP 080  
CN P 50  
CN P 50 (metal)  
CN Palladex 600  
CN Palladium black  
CN Palladium element  
CN SFP 1001P

MF Pd

CI COM

LC STN Files: AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO, CA,  
CANCERLIT, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS, CHEMINFORMRX,  
CHEMLIST, CIN, CSCHEM, CSNB, DDFU, DETHERM\*, DRUGU, EMBASE, ENCOMPLIT,  
ENCOMPLIT2, ENCOMPPAT, ENCOMPPAT2, HSDB\*, IFICDB, IFIPAT, IFIUDB, IPA,  
MEDLINE, MRCK\*, MSDS-OHS, NIOSHTIC, PIRA, PROMT, RTECS\*, TOXCENTER,  
TULSA, ULIDAT, USPAT2, USPATFULL, VTB

(\*File contains numerically searchable property data)

Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*

(\*\*Enter CHEMLIST File for up-to-date regulatory information)

Pd

73992 REFERENCES IN FILE CA (1957 TO DATE)

5060 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

74185 REFERENCES IN FILE CAPLUS (1957 TO DATE)

L6 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2003 ACS

RN 7440-06-4 REGISTRY

CN **Platinum (8CI, 9CI)** (CA INDEX NAME)

## OTHER NAMES:

CN C.I. 77795  
CN Furuuchi 8105  
CN Liquid Bright Platinum  
CN Platinum black  
CN Platinum element  
CN PR 0  
CN TP 1  
CN TP 1 (metal)  
CN TR 706  
DR 21547-63-7

MF Pt

CI COM

LC STN Files: ADISNEWS, AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO,  
CA, CABA, CANCERLIT, CAOLD, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS,  
CHEMINFORMRX, CHEMLIST, CHEMSAFE, CIN, CSCHEM, CSNB, DDFU, DETHERM\*,  
DIOGENES, DRUGU, EMBASE, ENCOMPLIT, ENCOMPLIT2, ENCOMPPAT, ENCOMPPAT2,  
HSDB\*, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE, MRCK\*, MSDS-OHS, NIOSHTIC,  
PIRA, PROMT, RTECS\*, TOXCENTER, TULSA, ULIDAT, USPAT2, USPATFULL, VTB

(\*File contains numerically searchable property data)

Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*

(\*\*Enter CHEMLIST File for up-to-date regulatory information)

Pt

107950 REFERENCES IN FILE CA (1957 TO DATE)  
5328 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
108167 REFERENCES IN FILE CAPLUS (1957 TO DATE)  
1 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

L7 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2003 ACS  
RN 7440-16-6 REGISTRY  
CN **Rhodium (8CI, 9CI)** (CA INDEX NAME)  
OTHER NAMES:  
CN Rhodium black  
CN Rhodium-103  
DR 24546-24-5, 100041-37-0  
MF Rh  
CI COM  
LC STN Files: AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CABA,  
CANCERLIT, CAOLD, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS, CHEMINFORMRX,  
CHEMLIST, CIN, CSCHEM, CSNB, DDFU, DRUGU, EMBASE, ENCOMPLIT, ENCOMPLIT2,  
ENCOMPAT, ENCOMPAT2, HSDB\*, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE,  
MRCK\*, MSDS-OHS, NIOSHTIC, PDLCOM\*, PIRA, PROMT, RTECS\*, TOXCENTER,  
TULSA, USPAT2, USPATFULL, VTB  
(\*File contains numerically searchable property data)  
Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*  
(\*\*Enter CHEMLIST File for up-to-date regulatory information)

Rh

31610 REFERENCES IN FILE CA (1957 TO DATE)  
3113 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
31654 REFERENCES IN FILE CAPLUS (1957 TO DATE)  
1 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

L8 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2003 ACS  
RN 12033-89-5 REGISTRY  
CN **Silicon nitride (Si3N4) (8CI, 9CI)** (CA INDEX NAME)  
OTHER NAMES:  
CN ASN 2  
CN Baysinid ST  
CN Ceralloy 147-31N  
CN Denka SN-BS  
CN E 05  
CN E 05 (nitride)  
CN E 10  
CN E 10 (nitride)  
CN EC 141  
CN Ekasin D  
CN Ekasin S  
CN GC 5A  
CN GS 44  
CN KBI  
CN KSN 10

•CN KSN 10SP-DW  
CN LC 12  
CN LC 12 (nitride)  
CN LC 12S  
CN M 11  
CN M 11 (abrasive)  
CN NBD 200  
CN NC 132  
CN NC 132 (ceramic)  
CN NC 350  
CN NC 350 (nitride)  
CN NCX 34  
CN NCX 5102  
CN Needlelok  
CN NT 154  
CN NU 30  
CN P 21FC  
CN Roydazide  
CN Siconide P 95  
CN **Silicon nitride**  
CN Silicon nitride (Si0.75N)  
CN Silicon nitride (SiN1.33)  
CN Silzot 7038  
CN Silzot 7038-1  
CN Silzot 7038-2  
CN Silzot HQ  
CN SiNova  
CN SN 220  
CN SN 252  
CN SN 7  
CN SN 7 (nitride)  
CN SN 73K  
CN SN 88  
CN SN 88 (nitride)  
CN SN 9FW

•ADDITIONAL NAMES NOT AVAILABLE IN THIS FORMAT - Use FCN, FIDE, or ALL for  
DISPLAY

DR 478270-75-6, 11113-86-3, 37248-41-2, 53095-88-8, 115950-29-3, 254906-02-0,  
274915-53-6, 329042-21-9, 331285-12-2

MF N4 Si3

CI COM, MAN

LC STN Files: AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO, CA,  
CANCERLIT, CAOLD, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS, CHEMLIST, CIN,  
CSCHEM, DETHERM\*, EMBASE, ENCOMPLIT, ENCOMPLIT2, ENCOMPPAT, ENCOMPPAT2,  
IFICDB, IFIPAT, IFIUDB, MEDLINE, MRCK\*, MSDS-OHS, NIOSHTIC, PIRA, PROMT,  
TOXCENTER, TULSA, USPAT2, USPATFULL, VTB

(\*File contains numerically searchable property data)

Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*

(\*\*Enter CHEMLIST File for up-to-date regulatory information)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

62058 REFERENCES IN FILE CA (1957 TO DATE)

851 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

62157 REFERENCES IN FILE CAPLUS (1957 TO DATE)

25 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

=> file hcaplus

FILE 'HCAPLUS' ENTERED AT 16:43:05 ON 15 MAY 2003

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FILE COVERS 1907 - 15 May 2003 VOL 138 ISS 20  
FILE LAST UPDATED: 14 May 2003 (20030514/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d que 122; d que 129; d que 133

|     |         |                   |        |        |   |
|-----|---------|-------------------|--------|--------|---|
| L4  | 1       | SEA FILE=REGISTRY | ABB=ON | PLU=ON | RUTHENIUM/CN  |
| L5  | 1       | SEA FILE=REGISTRY | ABB=ON | PLU=ON | PALLADIUM/CN  |
| L6  | 1       | SEA FILE=REGISTRY | ABB=ON | PLU=ON | PLATINUM/CN   |
| L7  | 1       | SEA FILE=REGISTRY | ABB=ON | PLU=ON | RHODIUM/CN  |
| L8  | 1       | SEA FILE=REGISTRY | ABB=ON | PLU=ON | "SILICON NITRIDE"/CN  |
| L9  | 90836   | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L4 OR RUTHENIUM OR RU   |
| L10 | 213818  | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L5 OR PALLADIUM OR PD OR P 50<br>OR MPP (W) (0303 OR 050 OR 080)  |
| L11 | 276839  | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L6 OR PLATINUM OR PT OR TR<br>706   |
| L12 | 104777  | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L7 OR RHODIUM OR RH   |
| L13 | 73605   | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L8 OR SILICON NITRIDE OR E<br>(W) (05 OR 10) OR KSN (W) (10 OR 10SP) OR LC (W) (12 OR 12S)<br>OR KBI OR NBD 200 OR NC (W) (132 OR 150) OR SN (W) (220 OR 252<br>OR 7 OR 73K OR 88 OR 9FW) |
| L14 | 517812  | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | CATALYSTS/CW  |
| L15 | 87211   | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | CATALYSIS+PFT/CT  |
| L16 | 100114  | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | (L9 OR L10 OR L11 OR L12) AND<br>L14  |
| L17 | 15840   | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | (L9 OR L10 OR L11 OR L12) AND<br>L15  |
| L18 | 157     | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L13 AND (L16 OR L17)  |
| L19 | 2041666 | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | NANO? OR ANGSTROM OR MICRO?   |
| L20 | 24      | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L18 AND L19   |
| L21 | 318071  | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | CATAL?/SC,SX  |
| L22 | 7       | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L20 AND L21   |

|     |        |                   |        |        |  |
|-----|--------|-------------------|--------|--------|--|
| L4  | 1      | SEA FILE=REGISTRY | ABB=ON | PLU=ON | RUTHENIUM/CN   |
| L5  | 1      | SEA FILE=REGISTRY | ABB=ON | PLU=ON | PALLADIUM/CN   |
| L6  | 1      | SEA FILE=REGISTRY | ABB=ON | PLU=ON | PLATINUM/CN  |
| L7  | 1      | SEA FILE=REGISTRY | ABB=ON | PLU=ON | RHODIUM/CN   |
| L9  | 90836  | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L4 OR RUTHENIUM OR RU  |
| L10 | 213818 | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L5 OR PALLADIUM OR PD OR P 50<br>OR MPP (W) (0303 OR 050 OR 080) |
| L11 | 276839 | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L6 OR PLATINUM OR PT OR TR<br>706                                |
| L12 | 104777 | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | L7 OR RHODIUM OR RH  |
| L21 | 318071 | SEA FILE=HCAPLUS  | ABB=ON | PLU=ON | CATAL?/SC,SX   |

•L23 52283 SEA FILE=HCAPLUS ABB=ON PLU=ON CVD OR LPCVD  
L24 1654 SEA FILE=HCAPLUS ABB=ON PLU=ON L23 AND (L9 OR L10 OR L11 OR  
L12)  
L26 195455 SEA FILE=HCAPLUS ABB=ON PLU=ON NANO?  
L27 102 SEA FILE=HCAPLUS ABB=ON PLU=ON L24 AND L26  
L28 12 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND L21  
L29 3 SEA FILE=HCAPLUS ABB=ON PLU=ON L28 AND (CATALYST SUPPORT OR  
CATALYTIC)/TI

L4 1 SEA FILE=REGISTRY ABB=ON PLU=ON RUTHENIUM/CN  
L5 1 SEA FILE=REGISTRY ABB=ON PLU=ON PALLADIUM/CN  
L6 1 SEA FILE=REGISTRY ABB=ON PLU=ON PLATINUM/CN  
L7 1 SEA FILE=REGISTRY ABB=ON PLU=ON RHODIUM/CN  
L9 90836 SEA FILE=HCAPLUS ABB=ON PLU=ON L4 OR RUTHENIUM OR RU  
L10 213818 SEA FILE=HCAPLUS ABB=ON PLU=ON L5 OR PALLADIUM OR PD OR P 50  
OR MPP (W) (0303 OR 050 OR 080)  
L11 276839 SEA FILE=HCAPLUS ABB=ON PLU=ON L6 OR PLATINUM OR PT OR TR  
706  
L12 104777 SEA FILE=HCAPLUS ABB=ON PLU=ON L7 OR RHODIUM OR RH  
L21 318071 SEA FILE=HCAPLUS ABB=ON PLU=ON CATAL?/SC, SX  
L26 195455 SEA FILE=HCAPLUS ABB=ON PLU=ON NANO?  
L30 51219 SEA FILE=HCAPLUS ABB=ON PLU=ON ANNEALING+NT/CT  
L32 13 SEA FILE=HCAPLUS ABB=ON PLU=ON (L9 OR L10 OR L11 OR L12) AND  
L21 AND L26 AND L30  
L33 8 SEA FILE=HCAPLUS ABB=ON PLU=ON L32 NOT (ULTRATHIN OR SUM OR  
COLLOID OR NANOTUBES OR METHANOL OR TI02)/TI

=> s 122 or 129 or 133

L88 18 L22 OR L29 OR L33

=> file scisearch; d que 146; d que 153; d que 154; d que 155; d que 156; d que 159  
FILE 'SCISEARCH' ENTERED AT 16:45:39 ON 15 MAY 2003  
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FILE COVERS 1974 TO 9 May 2003 (20030509/ED)

L34 40928 SEA FILE=SCISEARCH ABB=ON PLU=ON RUTHENIUM OR RU  
L35 76735 SEA FILE=SCISEARCH ABB=ON PLU=ON PALLADIUM OR PD OR P 50 IR  
MPP (W) (0303 OR 050 OR 080)  
L36 86537 SEA FILE=SCISEARCH ABB=ON PLU=ON PLATINUM OR PT OR TR 706  
L37 38294 SEA FILE=SCISEARCH ABB=ON PLU=ON RHODIUM OR RH  
L38 10249 SEA FILE=SCISEARCH ABB=ON PLU=ON SILICON NITRIDE OR E (W)  
(05 OR 10) OR KSN (W) (10 OR 10SP) OR LC (W) (12 OR 12S) OR  
KBI OR NBD 200 OR NC (W) (132 OR 150) OR SN (W) (220 OR 252 OR  
7 OR 73K OR 88 OR 9FW)  
L39 167268 SEA FILE=SCISEARCH ABB=ON PLU=ON CATALYS?  
L44 195748 SEA FILE=SCISEARCH ABB=ON PLU=ON NANO? OR ANGSTROM?  
L46 0 SEA FILE=SCISEARCH ABB=ON PLU=ON (L34 OR L35 OR L36 OR L37)  
AND L39 AND L44 AND L38

L34 40928 SEA FILE=SCISEARCH ABB=ON PLU=ON RUTHENIUM OR RU  
L35 76735 SEA FILE=SCISEARCH ABB=ON PLU=ON PALLADIUM OR PD OR P 50 IR  
MPP (W) (0303 OR 050 OR 080)

L36 86537 SEA FILE=SCISEARCH ABB=ON PLU=ON PLATINUM OR PT OR TR 706  
L37 38294 SEA FILE=SCISEARCH ABB=ON PLU=ON RHODIUM OR RH  
L38 10249 SEA FILE=SCISEARCH ABB=ON PLU=ON SILICON NITRIDE OR E (W)  
(05 OR 10) OR KSN (W) (10 OR 10SP) OR LC (W) (12 OR 12S) OR  
KBI OR NBD 200 OR NC (W) (132 OR 150) OR SN (W) (220 OR 252 OR  
7 OR 73K OR 88 OR 9FW)  
L50 54316 SEA FILE=SCISEARCH ABB=ON PLU=ON NANO?/TI  
L51 80049 SEA FILE=SCISEARCH ABB=ON PLU=ON CATALYS?/TI  
L53 0 SEA FILE=SCISEARCH ABB=ON PLU=ON (L34 OR L35 OR L36 OR L37)  
AND L38 AND L50 AND L51

L34 40928 SEA FILE=SCISEARCH ABB=ON PLU=ON RUTHENIUM OR RU  
L35 76735 SEA FILE=SCISEARCH ABB=ON PLU=ON PALLADIUM OR PD OR P 50 IR  
MPP (W) (0303 OR 050 OR 080)  
L36 86537 SEA FILE=SCISEARCH ABB=ON PLU=ON PLATINUM OR PT OR TR 706  
L37 38294 SEA FILE=SCISEARCH ABB=ON PLU=ON RHODIUM OR RH  
L38 10249 SEA FILE=SCISEARCH ABB=ON PLU=ON SILICON NITRIDE OR E (W)  
(05 OR 10) OR KSN (W) (10 OR 10SP) OR LC (W) (12 OR 12S) OR  
KBI OR NBD 200 OR NC (W) (132 OR 150) OR SN (W) (220 OR 252 OR  
7 OR 73K OR 88 OR 9FW)  
L41 15342 SEA FILE=SCISEARCH ABB=ON PLU=ON LPCVD OR CVD  
L50 54316 SEA FILE=SCISEARCH ABB=ON PLU=ON NANO?/TI  
L51 80049 SEA FILE=SCISEARCH ABB=ON PLU=ON CATALYS?/TI  
L54 0 SEA FILE=SCISEARCH ABB=ON PLU=ON (L34 OR L35 OR L36 OR L37)  
AND L38 AND L50 AND L51 AND L41

L34 40928 SEA FILE=SCISEARCH ABB=ON PLU=ON RUTHENIUM OR RU  
L35 76735 SEA FILE=SCISEARCH ABB=ON PLU=ON PALLADIUM OR PD OR P 50 IR  
MPP (W) (0303 OR 050 OR 080)  
L36 86537 SEA FILE=SCISEARCH ABB=ON PLU=ON PLATINUM OR PT OR TR 706  
L37 38294 SEA FILE=SCISEARCH ABB=ON PLU=ON RHODIUM OR RH  
L38 10249 SEA FILE=SCISEARCH ABB=ON PLU=ON SILICON NITRIDE OR E (W)  
(05 OR 10) OR KSN (W) (10 OR 10SP) OR LC (W) (12 OR 12S) OR  
KBI OR NBD 200 OR NC (W) (132 OR 150) OR SN (W) (220 OR 252 OR  
7 OR 73K OR 88 OR 9FW)  
L42 71964 SEA FILE=SCISEARCH ABB=ON PLU=ON ANNEAL?  
L50 54316 SEA FILE=SCISEARCH ABB=ON PLU=ON NANO?/TI  
L51 80049 SEA FILE=SCISEARCH ABB=ON PLU=ON CATALYS?/TI  
L55 0 SEA FILE=SCISEARCH ABB=ON PLU=ON (L34 OR L35 OR L36 OR L37)  
AND L38 AND L50 AND L51 AND L42

L34 40928 SEA FILE=SCISEARCH ABB=ON PLU=ON RUTHENIUM OR RU  
L35 76735 SEA FILE=SCISEARCH ABB=ON PLU=ON PALLADIUM OR PD OR P 50 IR  
MPP (W) (0303 OR 050 OR 080)  
L36 86537 SEA FILE=SCISEARCH ABB=ON PLU=ON PLATINUM OR PT OR TR 706  
L37 38294 SEA FILE=SCISEARCH ABB=ON PLU=ON RHODIUM OR RH  
L38 10249 SEA FILE=SCISEARCH ABB=ON PLU=ON SILICON NITRIDE OR E (W)  
(05 OR 10) OR KSN (W) (10 OR 10SP) OR LC (W) (12 OR 12S) OR  
KBI OR NBD 200 OR NC (W) (132 OR 150) OR SN (W) (220 OR 252 OR  
7 OR 73K OR 88 OR 9FW)  
L43 34107 SEA FILE=SCISEARCH ABB=ON PLU=ON VAPOR DEPOSIT?  
L50 54316 SEA FILE=SCISEARCH ABB=ON PLU=ON NANO?/TI  
L51 80049 SEA FILE=SCISEARCH ABB=ON PLU=ON CATALYS?/TI  
L56 0 SEA FILE=SCISEARCH ABB=ON PLU=ON (L34 OR L35 OR L36 OR L37)  
AND L38 AND L50 AND L51 AND L43



L34 40928 SEA FILE=SCISEARCH ABB=ON PLU=ON RUTHENIUM OR RU  
L35 76735 SEA FILE=SCISEARCH ABB=ON PLU=ON PALLADIUM OR PD OR P 50 IR  
MPP (W) (0303 OR 050 OR 080)  
L36 86537 SEA FILE=SCISEARCH ABB=ON PLU=ON PLATINUM OR PT OR TR 706  
L37 38294 SEA FILE=SCISEARCH ABB=ON PLU=ON RHODIUM OR RH  
L50 54316 SEA FILE=SCISEARCH ABB=ON PLU=ON NANO?/TI  
L51 80049 SEA FILE=SCISEARCH ABB=ON PLU=ON CATALYS?/TI  
L57 215053 SEA FILE=SCISEARCH ABB=ON PLU=ON SILICON OR SILICA  
L58 32 SEA FILE=SCISEARCH ABB=ON PLU=ON (L34 OR L35 OR L36 OR L37)  
AND L50 AND L51 AND L57  
L59 13 SEA FILE=SCISEARCH ABB=ON PLU=ON L58 AND (NEW MODEL OR  
SYNTHESIS OR FABRICAT? OR ARCHITECT? OR WAFER OR NANOSTRUCT?  
OR CHITOSAN)/TI

=> file wpix

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=> d que 179; d que 187

L60 190477 SEA FILE=WPIX ABB=ON PLU=ON RUTHENIUM OR RU  
L61 41887 SEA FILE=WPIX ABB=ON PLU=ON PALLADIUM OR PD OR P 50 IR MPP  
(W) (0303 OR 050 OR 080)  
L62 306686 SEA FILE=WPIX ABB=ON PLU=ON PLATINUM OR PT OR TR 706  
L63 23100 SEA FILE=WPIX ABB=ON PLU=ON RHODIUM OR RH  
L65 274045 SEA FILE=WPIX ABB=ON PLU=ON CATALYS?  
L66 17240 SEA FILE=WPIX ABB=ON PLU=ON NANO?  
L67 4090 SEA FILE=WPIX ABB=ON PLU=ON METAL SUPPORT  
L77 171394 SEA FILE=WPIX ABB=ON PLU=ON B01J?/IC, ICM, ICS  
L79 3 SEA FILE=WPIX ABB=ON PLU=ON (L60 OR L61 OR L62 OR L63) AND  
L66 AND L65 AND L67 AND L77

L60 190477 SEA FILE=WPIX ABB=ON PLU=ON RUTHENIUM OR RU

L61 41887 SEA FILE=WPIX ABB=ON PLU=ON PALLADIUM OR PD OR P 50 IR MPP  
(W) (0303 OR 050 OR 080)  
L62 306686 SEA FILE=WPIX ABB=ON PLU=ON PLATINUM OR PT OR TR 706  
L63 23100 SEA FILE=WPIX ABB=ON PLU=ON RHODIUM OR RH  
L83 138724 SEA FILE=WPIX ABB=ON PLU=ON CATALYS?/TI  
L85 2066 SEA FILE=WPIX ABB=ON PLU=ON NANO? (3A) (ENGINEER OR MANUF?  
OR SYNTH? OR PREP?)  
L86 22 SEA FILE=WPIX ABB=ON PLU=ON (L60 OR L61 OR L62 OR L63) AND  
L85 AND L83  
L87 4 SEA FILE=WPIX ABB=ON PLU=ON L86 AND (NANOMETRE OR VAPOUR OR  
SALT)/TI

=> s 179 or 187

L89 7 L79 OR L87

=> dup rem 188 159 189

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PROCESSING COMPLETED FOR L88

PROCESSING COMPLETED FOR L59

PROCESSING COMPLETED FOR L89

L90 38 DUP REM L88 L59 L89 (0 DUPLICATES REMOVED)

ANSWERS '1-18' FROM FILE HCAPLUS

ANSWERS '19-31' FROM FILE SCISEARCH

ANSWERS '32-38' FROM FILE WPIX

=> d ibib ab 190 1-38

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L90 ANSWER 1 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2003:84048 HCAPLUS

DOCUMENT NUMBER: 138:98506

TITLE: Formation of carbon **nanotubes** by catalytic  
chemical vapor deposition

INVENTOR(S): Mauthner, Klaus; Leister, Erich; Hammel, Ernst

PATENT ASSIGNEE(S): Electrovac, Fabrikation Elektrotechnischer  
Spezialartikel Gesellschaft m.b.H., Austria

SOURCE: Austrian, 10 pp.

CODEN: AUXXAK

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.    | KIND | DATE     | APPLICATION NO. | DATE     |
|---------------|------|----------|-----------------|----------|
| AT 409637     | B    | 20020925 | AT 2001-421     | 20010316 |
| WO 2002075018 | A1   | 20020926 | WO 2002-AT48    | 20020212 |

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,

CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,  
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,  
PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ,  
UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU,  
TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH,  
CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,  
BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: AT 2001-421 A 20010316

AB The present invention describes a catalytic chem. vapor deposition (CCVD) procedure for forming carbon **nanotubes**. Gas phase carbon is deposited on a substrate, on which a catalytic layer of nickel or cobalt is present. The catalytic layer is thermally activated in a reducing atm. prior to the deposition of the **nanotubes**.

L90 ANSWER 2 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:779205 HCAPLUS

DOCUMENT NUMBER: 138:9248

TITLE: Quantized Double-Layer Charging of Highly Monodisperse Metal **Nanoparticles**

AUTHOR(S): Hicks, Jocelyn F.; Miles, Deon T.; Murray, Royce W.  
CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North Carolina CB3290, Chapel Hill, NC, 27599-3290, USA

SOURCE: Journal of the American Chemical Society (2002), 124(44), 13322-13328

CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The authors describe unprecedented resoln. of electrochem. obsd. quantized double layer (QDL) charging, attained using reduced soln. temps. and with an annealing procedure that produces hexanethiolate monolayer protected Au clusters (C6 MPCs) with a high level of monodispersity in charging capacitance, CCLU. The spacing  $\Delta V = e/CCLU$  on the electrochem. potential axis between single electron changes in the electronic charge of **nanoscopic** metal particles is detd. by their effective capacitance CCLU. The high monodispersity of the C6 MPCs with Au<sub>140</sub> cores facilitates (a) detailed rotated disk and cyclic voltammetric measurements, (b) simulation of QDL wave shapes based on assumed reversible, multivalent redox-like behavior, (c) detn. of **nanoparticle** diffusion rates, and (d) observation of as many as 13 changes in the MPC charge state, from MPC<sub>6-</sub> to MPC<sub>7+</sub>. The single electron QDL charging peaks are quite evenly spaced ( $\Delta V$  const.) at potentials near the MPC potential of zero charge, but are irregularly spaced at more pos. and neg. potentials. The irregular spacing is difficult to rationalize with classical double layer capacitance ideas and is proposed to arise from a correspondingly structured (e.g., not smooth) d. of electronic states of the **nanoparticle** core, resulting from its small HOMO/LUMO gap and incipiently mol.-like behavior.

REFERENCE COUNT: 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L90 ANSWER 3 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:370521 HCAPLUS

DOCUMENT NUMBER: 137:114946

TITLE: **Nanoscale** surface chemistry

AUTHOR(S): Madey, Theodore E.; Pelhos, Kalman; Wu, Qifei; Barnes, Robin; Ermanoski, Ivan; Chen, Wenhua; Kolodziej, Jacek J.; Rowe, John E.

CORPORATE SOURCE: Department of Physics and Astronomy and Laboratory for

SOURCE: Surface Modification, Rutgers, The State University of New Jersey, Piscataway, NJ, 08854-8019, USA  
Proceedings of the National Academy of Sciences of the United States of America (2002), 99(9, Suppl. 2), 6503-6508  
CODEN: PNASA6; ISSN: 0027-8424  
PUBLISHER: National Academy of Sciences  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB We report evidence in several expts. for **nanometer**-size effects in surface chem. The evidence concerns bimetallic systems, monolayer films of **Pt** or **Pd** on W(111) surfaces. Pyramidal facets with {211} faces are formed on annealing on phys. monolayer of **Pt**, **Pd** on a W(111) substrate, and facet sizes increase with annealing temp. We used synchrotron radiation-based soft x-ray photoemission to show that monolayer films of **Pt**, **Pd**, on W "float" on the outer surface, whereas multilayer films form alloys on annealing. Acetylene reactions over bimetallic planar and faceted **Pd**/W surfaces exhibit size effects on the **nanometer** scale, i.e., thermal desorption spectra of reactively formed benzene and ethylene (after acetylene adsorption) change systematically with facet size. In the second case, the decompn. of C<sub>2</sub>H<sub>2</sub> over planar and faceted Ir(210) surfaces also exhibits structure sensitivity; temp. programmed desorption of H<sub>2</sub> from C<sub>2</sub>H<sub>2</sub> dissocn. depends on the **nanoscale** surface structure. Finally, we have characterized interactions of Cu with the highly ordered S(4 .times. 4)/W(111) surface. The substrate is a sulfur-induced **nanoscale** reconstruction of W(111) with (4 .times. 4) periodicity, having broad planar terraces (.apprxeq.30 nm in width). Fractional monolayers of vapor-deposited Cu grow as three-dimensional clusters on the S(4 .times. 4) surface over a wide coverage range. At low Cu coverage (.ltoreq. 0.1 ML), Cu **nanoclusters** nucleate preferentially at characteristic 3-fold hollow sites; we find a clear energetic preference for one type of site over others, and evidence for self-limiting growth of **nanoclusters**

REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L90 ANSWER 4 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:861388 HCAPLUS

DOCUMENT NUMBER: 138:143054

TITLE: Support effect and active sites on promoted **ruthenium** catalysts for ammonia synthesis

AUTHOR(S): Hansen, Thomas W.; Hansen, Poul L.; Dahl, Soren; Jacobsen, Claus J. H.

CORPORATE SOURCE: Haldor Topsoe A/S, Lyngby, DK-2800, Den.

SOURCE: Catalysis Letters (2002), 84(1-2), 7-12

CODEN: CALEER; ISSN: 1011-372X

PUBLISHER: Kluwer Academic/Plenum Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The catalytic activities of three supported, barium-promoted **ruthenium** catalysts for ammonia synthesis are reported. The three supports are **silicon nitride** (Si<sub>3</sub>N<sub>4</sub>), magnesium aluminum spinel (MgAl<sub>2</sub>O<sub>4</sub>), and graphitized carbon (C). The effect of the promoter on the activity is strongly dependent on the choice of support material in accordance with several previous observations. Here, this dependence is ascribed to a difference in the affinity of the promoter for the different supports. It is shown how it is possible to image the barium promoter present on the surface of **ruthenium** crystals in passivated catalysts by conventional high-resoln. transmission electron

**microscopy** (HRTEM). By comparison with in situ HRTEM images obtained lately from similar catalysts, and with ref. to recent d. functional theory (DFT) calcns., we suggest that active B5-type sites on the surfaces of the ruthenium crystals are promoted by nearby promoter atoms via electrostatic interactions.

REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L90 ANSWER 5 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2001:368132 HCAPLUS

DOCUMENT NUMBER: 135:97851

TITLE: Reactive Deposition of Metal Thin Films within Porous Supports from Supercritical Fluids

AUTHOR(S): Fernandes, Neil E.; Fisher, Scott M.; Poshusta, Joseph C.; Vlachos, Dionisios G.; Tsapatsis, Michael; Watkins, James J.

CORPORATE SOURCE: Department of Chemical Engineering, The University of Massachusetts, Amherst, MA, 01003, USA

SOURCE: Chemistry of Materials (2001), 13(6), 2023-2031  
CODEN: CMATEX; ISSN: 0897-4756

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Continuous **palladium** films were synthesized at controlled depths within porous alumina disks by H<sub>2</sub> redn. of organopalladium compds. dissolved in supercrit. CO<sub>2</sub> at 60.degree. using an opposing reactants deposition geometry. Film position was controlled by adjusting the relative concns. of H<sub>2</sub> and the palladium precursor (.pi.-2-methylallyl(cyclopentadienyl)palladium (II) or palladium(II) hexafluoroacetylacetonate) on opposite sides of the alumina substrate. Because of a disparity in the diffusivity of the metal precursor and H<sub>2</sub> in the support, a temporary barrier of poly-4-methyl-1-pentene on the H<sub>2</sub> side of the alumina substrate was used to reduce H<sub>2</sub> flux in a controlled manner. Guided by a simple mass transport model, Pd films between 2 and 80 .mu.m thick were deposited at prescribed depths between 80 and 600 .mu.m as measured from the precursor side. Electron probe microanal. indicated complete pore filling of the porous alumina at the reaction zone and x-ray diffraction revealed that the structure of the deposit is **nanocryst**. The flux of N<sub>2</sub> through the alumina disk was reduced by over 4 orders of magnitude after deposition and annealing at 500.degree..

REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L90 ANSWER 6 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2001:148368 HCAPLUS

DOCUMENT NUMBER: 134:227993

TITLE: Microstructure of (100) silicon wafer implanted by 1 MeV Ru+ ions

AUTHOR(S): Chen, Y. L.; Shao, G.; Sharpe, J.; Gwilliam, R. M.; Kirkby, K. Reeson; Homewood, K. P.; Goringe, M. J.

CORPORATE SOURCE: School of Mechanical and Materials Engineering, University of Surrey, Surrey, GU2 5XH, UK

SOURCE: Journal of Materials Science (2001), 36(2), 321-327  
CODEN: JMTSAS; ISSN: 0022-2461

PUBLISHER: Kluwer Academic Publishers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A p-type device grade Si wafer was implanted by 1 MeV Ru+ ions to a dose of 5.67 .times. 10<sup>16</sup> cm<sup>-2</sup>. The microstructures of the as-implanted and annealed samples were studied mainly by anal. TEM and

XRD. The results showed that the implantation resulted in a well-defined surface layer of .apprx.910 nm in thickness. The layer was composed of ultra-fine Ru<sub>2</sub>Si<sub>3</sub> crystallites in an amorphous matrix. After annealing, the inner part of the layer recovered completely to single crystal Si with nano-scaled Ru<sub>2</sub>Si<sub>3</sub> embedded in it. A .apprx. 660 nm thick polycryst. region consisting of Si and Ru<sub>2</sub>Si<sub>3</sub> grains was formed at the surface.

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L90 ANSWER 7 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2001:464002 HCAPLUS

DOCUMENT NUMBER: 135:216423

TITLE: Preparation and reactivity of **Rh nanoparticles** on TiO<sub>2</sub>(110)-(1.times.2) surface

AUTHOR(S): Berko, A.; Szoko, J.; Solymosi, F.

CORPORATE SOURCE: Institute of Solid State and Radiochemistry, Reaction Kinetics Research Group of the Hungarian Academy of Sciences, University of Szeged, Szeged, H-6701, Hung.

SOURCE: Solid State Ionics (2001), 141-142, 197-202

CODEN: SSIOD3; ISSN: 0167-2738

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Arrays of **Rh nanoparticles** with independently controlled sizes and av. distances were prepd. by exploiting the surface temp.-dependent kinetics of the **Rh** adatoms and **nanocluster** migration processes on TiO<sub>2</sub>(110)-(1.times.2) surface. The supported **Rh nanoparticles** fabricated in this way exhibit a very narrow size distribution. The characteristic particle diam. can be varied in the range of 2-20 nm with a desired interparticle distance tunable between 5 and 100 nm. The distribution and the morphol. of the **nanoparticles** were characterized by scanning tunneling microscopy. The advantage of this method in comparison with lithog. techniques is its relative simplicity and the possibility of the prepn. of metal particles in the typical 'catalytic regime'. The model catalysts so produced are applicable in the study of size-dependent reactivity of the **nanoparticles** (gas-induced disruption, agglomeration, encapsulation, catalytic activity). It is also suggested that the tailored particle arrays can serve as templates for further **nanosstructural** fabrication.

REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L90 ANSWER 8 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:22105 HCAPLUS

DOCUMENT NUMBER: 132:185977

TITLE: **Platinum and Palladium** Films

Obtained by Low-Temperature MOCVD for the Formation of Small Particles on Divided Supports as **Catalytic** Materials

AUTHOR(S): Hierso, Jean-Cyrille; Feurer, Roselyne; Kalck, Philippe

CORPORATE SOURCE: Laboratoire de Catalyse Chimie Fine et Polymeres and the Laboratoire des Interfaces et Materiaux (UPRESA-CNRS 5071), Ecole Nationale Supérieure de Chimie de Toulouse, Toulouse, 31077, Fr.

SOURCE: Chemistry of Materials (2000), 12(2), 390-399

CODEN: CMATEX; ISSN: 0897-4756

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE:

English

AB CVD studies devoted to **platinum** and **palladium** deposition on planar substrates for microelectronics have clearly shown that it is possible to reach high-quality deposits at temps. above 200 .degree.C. Attempts to prep. pure metallic deposits at temps. around 100 .degree.C and even lower are of general interest, since a no. of temp.-sensitive supports could be then exploited. An other attracting issue in the field of catalysts elaboration is presented here. **Pt** (hfa)<sub>2</sub>, **PtMe**<sub>2</sub>(cod), **Pd**(Cp)(.eta.<sup>3</sup>-C<sub>3</sub>H<sub>5</sub>), and **Pd**(.eta.<sup>3</sup>-C<sub>3</sub>H<sub>5</sub>)(hfa) have been selected to produce by MOCVD **platinum** and **palladium** deposits on planar and on divided supports. The EI-mass spectrometry of the precursor complexes as well as their thermal behavior are reported (TGA, DSC, vapor pressure equations). Introduction of hydrogen in the carrier gas results in a dramatic decrease of the deposition temp. (35-120 .degree.C) of the complexes. XPS and electron microprobe analyses have shown that **PtMe**<sub>2</sub>(cod), **Pd**(Cp)(.eta.<sup>3</sup>-C<sub>3</sub>H<sub>5</sub>), and **Pd**(.eta.<sup>3</sup>-C<sub>3</sub>H<sub>5</sub>)(hfa) are suitable precursors to produce pure thin films at these remarkably low temps. **Pt**(hfa)<sub>2</sub> gave poor results since the deposits are contaminated with fluorine, oxygen, and principally carbon. Using the CVD method in a fluidized bed under reduced pressure conditions allowed the deposition of the metals on porous divided substrates. Highly dispersed metallic particles of **palladium** and **platinum** on silica can be prepd. under very mild temps. (below 120 .degree.C). TEM micrographs revealed a narrow size dispersion of the nanoparticles (av. size 1-3 nm). EDX analyses did not show any contamination of the deposits. A high supersatn. regime was identified to be a crucial parameter in the fluidized bed-MOCVD method, allowing a good nucleation rate with regard to the growth rate. Catalysts prepd. by this method, and contg. **palladium** and **platinum** on porous silica, were highly active for the dehydrogenation of cyclohexane.

REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L90 ANSWER 9 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2000:246208 HCAPLUS

DOCUMENT NUMBER: 132:340419

TITLE: The incorporation of **Pt nanoparticles** into boron-doped diamond thin-films: dimensionally stable **catalytic** electrodes

AUTHOR(S): Wang, Jian; Swain, Greg M.; Tachibana, Takeshi; Kobashi, Koji

CORPORATE SOURCE: Department of Chemistry and Biochemistry, Utah State University, Logan, UT, 84322-0300, USA

SOURCE: Journal of New Materials for Electrochemical Systems (2000), 3(1), 75-82

CODEN: JMESFQ; ISSN: 1480-2422

PUBLISHER: Journal of New Materials for Electrochemical Systems

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A polycryst., **boron-doped diamond** thin-film was co-deposited with **Pt** on conducting Si (100) and **Pt** substrates. The resulting dimensionally stable and corrosion-resistant diamond thin-film consists of well-faceted microcrystallites with dispersed **Pt** particles incorporated into the surface. The metal particles are anchored into the diamond surface and range in diam. from 10 to 500 nm. The active **Pt** metal loading was at 200-400 ng/cm<sup>2</sup> (diamond electrode geometric area). Most interestingly, the **Pt** particles at the film surface are in electronic communication with the current collecting Si or **Pt** substrate through the boron-doped diamond matrix, and

they are electroactive for the UPD of hydrogen and the oxidn. of methanol. The dispersed Pt particles are extremely stable as no loss in the activity was obsd. after 1000 potential cycles between the oxygen and hydrogen evolution regimes in 0.1M HClO<sub>4</sub>. The film was fully characterized by SEM, energy dispersive x-ray anal., at. force microscopy, Auger electron spectroscopy, Raman spectroscopy, powder x-ray diffraction, secondary ion mass spectrometry and cyclic voltammetry.

REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L90 ANSWER 10 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1999:297349 HCAPLUS

DOCUMENT NUMBER: 130:317116

TITLE: Preparation of **nanometric** metal, metal oxide, and semiconductor cluster catalysts

INVENTOR(S): Spatz, Joachim; Moller, Martin; Herzog, Thomas; Mossmer, Stefan; Ziemann, Paul

PATENT ASSIGNEE(S): Universitat Ulm, Germany

SOURCE: PCT Int. Appl., 59 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.   | KIND | DATE     | APPLICATION NO.  | DATE     |
|--|------|----------|------------------|----------|
| WO 9921652   | A2   | 19990506 | WO 1998-EP6874   | 19981029 |
| WO 9921652   | A3   | 19990715 |                  |          |
| W: AU, CA, JP, KR, LK, US  |      |          |                  |          |
| RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE |      |          |                  |          |
| DE 19747815  | A1   | 19990506 | DE 1997-19747815 | 19971029 |
| DE 19747816  | A1   | 19990506 | DE 1997-19747816 | 19971029 |
| DE 19843411  | A1   | 20000323 | DE 1998-19843411 | 19980919 |
| CA 2308302   | AA   | 19990506 | CA 1998-2308302  | 19981029 |
| AU 9916652   | A1   | 19990517 | AU 1999-16652    | 19981029 |
| EP 1027157   | A2   | 20000816 | EP 1998-961111   | 19981029 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, NL, SE                      |      |          |                  |          |

PRIORITY APPLN. INFO.: DE 1997-19747815 A 19971029

DE 1997-19747816 A 19971029

DE 1998-19843411 A 19980919

WO 1998-EP6874 W 19981029

AB The invention relates to nanometric structuring and decorating of substrates. The invention esp. relates to surface decorated substrates on which ordered nanometric surface structures comprised of metal and/or metal oxide clusters and/or semiconductor clusters are deposited. The invention also relates to a method for producing and applying said surface decorated structures in order to epoxidize C3-C8-alkenes or to oxidize CO to CO<sub>2</sub>, and relates to surface structured substrates, esp. Pt, Au, GaAs, InyGaAs, AlxGaAs, Si, SiO<sub>2</sub>, Ge, SixNy, SixGaAs, InP, InPSi, GaInAsP, glass, graphite, diamond, mica, SrTiO<sub>3</sub> or the doped modifications thereof, which are nanometrically structured over macroscopic areas. In addn., the invention relates to a method for the prodn. of said surface structured substrates. The invention is based on the film formation of core shell polymer systems whose core areas are selectively modified or charged with corresponding metal compds. in a soln. and construct the structures which are orderly arranged in the thin films. These films which are deposited on the substrate surfaces are selectively etched in such a way that the org. polymer components are completely removed and, as a result, the



substrate is decorated in an orderly arrangement by the inorg. residues. The structured films can further serve as masks which make it possible to selectively etch the substrate and to transfer such a structure, said structure given by the film, to the substrate.

L90 ANSWER 11 OF 38 HCAPLUS COPYRIGHT 2003 ACS  
ACCESSION NUMBER: 1998:284978 HCAPLUS  
DOCUMENT NUMBER: 129:45699  
TITLE: SSIMS and XPS studies of reconstruction of alumina-supported Rh particles  
AUTHOR(S): Stara, I.; Di Salvo, J. -P.; Nehasil, V.; Matolin, V.; Gillet, E.  
CORPORATE SOURCE: SERMEC, Faculte des Sciences et Techniques de Saint-Jerome, Marseille, 13397, Fr.  
SOURCE: Surface Review and Letters (1998), 5(1), 375-379  
CODEN: SRLEFH; ISSN: 0218-625X  
PUBLISHER: World Scientific Publishing Co. Pte. Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Rhodium particles were vapor-deposited on (-1012) alpha.-alumina and polycryst. gamma.-alumina substrates. Variations of morphol. parameters during the growth and/or thermal annealing in vacuum, oxygen and CO atm. have been investigated by means of static SIMS and XPS. The ratios of Rh/substrate ion species and the Rh 3d electron binding energy variations indicated changes in metal coverage given by particle size and dispersion variations. The heating of as-deposited particles in vacuum led to the particle coalescence. On the other hand the oxygen interactions with particles gave an increase of particle dispersion.

REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L90 ANSWER 12 OF 38 HCAPLUS COPYRIGHT 2003 ACS  
ACCESSION NUMBER: 1997:720886 HCAPLUS  
DOCUMENT NUMBER: 127:311804  
TITLE: Characterization of oxide supported rhodium nanocrystals: habit, surface structure and catalytic activity  
AUTHOR(S): Rupprechter, G.; Hayek, K.; Hofmeister, H.  
CORPORATE SOURCE: Inst. Phys. Chemistry, Leopold-Franzens-Univ. Innsbruck, Innsbruck, A-6020, Austria  
SOURCE: Nanostructured Materials (1997), 9(1-8), 311-314  
CODEN: NMAEE7; ISSN: 0965-9773  
PUBLISHER: Elsevier  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Well-faceted Rh nanocrystals, epitaxially grown on NaCl substrates and supported by amorphous alumina, were selected to study the effect of annealing in O2 and H2 on the particle microstructure and catalytic properties. The habit and the surface compn. of the crystallites were detd. by high resoln. electron microscopy assisted by image contrast simulation, and by electron diffraction. Their catalytic performance in the hydrogenolysis of alkanes was tested by microreactor kinetics. Model catalysts with high turnover frequencies mainly exhibited Rh particles with disordered surface structures (e.g. polycryst. Rh particles or sandwich structures of Rh and Rh2O3), while smooth low-index facets dominated in less active catalysts. The results confirm that low coordinated sites are preferred for hydrogenolysis.

L90 ANSWER 13 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1995:410739 HCAPLUS  
DOCUMENT NUMBER: 122:171255  
TITLE: **Catalyst support** and method of preparation  
INVENTOR(S): Serp, Philippe; Feurer, Roselyne Destailats; Kalck, Philipe; Molinier, Jacques; Morancho, Roland; Guerler, Jean-Paul  
PATENT ASSIGNEE(S): Communauté Economique, Luxembourg  
SOURCE: Fr. Demande, 20 pp.  
CODEN: FRXXBL  
DOCUMENT TYPE: Patent  
LANGUAGE: French  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO. | KIND | DATE     | APPLICATION NO. | DATE     |
|------------|------|----------|-----------------|----------|
| FR 2707526 | A1   | 19950120 | FR 1993-8656    | 19930712 |
| FR 2707526 | B1   | 19950922 |                 |          |
| WO 9502453 | A1   | 19950126 | WO 1994-FR869   | 19940712 |

W: CA, US

RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

PRIORITY APPLN. INFO.: FR 1993-8656 19930712

AB The invention concerns a method of prepn. of a catalyst support constituted of porous support grains on which are dispersed transition metal particles of nanoscale size (mean diam. < 2 nm), with a dispersion > 70%. The method consists of using as a precursor an organometallic complex submitted to activation by thermal decompn., in continuous diln. of vapors of the precursor in a gas carrier, mixed in with an activation gas, in particular a reductive gas favoring formation of active mol. species from the organometallic complex, delivering a continuous current of the gas charge across a bed of porous grains at pressure < 1 bar in conditions to ensure fluidization of the grains, activating the organometallic precursor during its passage in the fluidized bed and ensuring thermal decompn. of the active mol. species which are adsorbed on the support grains.

L90 ANSWER 14 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1995:452248 HCAPLUS  
DOCUMENT NUMBER: 122:195027  
TITLE: Reticulated ceramic particles, and their manufacture and use  
INVENTOR(S): Whitman, David William  
PATENT ASSIGNEE(S): Rohm and Haas Co., USA  
SOURCE: Eur. Pat. Appl., 14 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.        | KIND | DATE     | APPLICATION NO. | DATE     |
|-------------------|------|----------|-----------------|----------|
| EP 639544         | A2   | 19950222 | EP 1994-305507  | 19940726 |
| EP 639544         | A3   | 19970709 |                 |          |
| EP 639544         | B1   | 20000503 |                 |          |
| R: DE, FR, GB, IT |      |          |                 |          |
| US 5399535        | A    | 19950321 | US 1993-107861  | 19930817 |
| ZA 9405821        | A    | 19950217 | ZA 1994-5821    | 19940804 |
| CA 2129769        | AA   | 19950218 | CA 1994-2129769 | 19940809 |
| JP 07187846       | A2   | 19950725 | JP 1994-213227  | 19940816 |

\*PRIORITY APPLN. INFO.: US 1993-107861 19930817

AB The particles have **microporous** vol. 0-60, mesoporous vol. 5-95, and macroporous vol. 0-95 for a total of 100% of the porosity. The particles are manufd. by impregnating a porous matrix material with .gtoreq.1 liq. precursor ceramics, forming a gel from the precursors, forming ceramics from the gel, and removing at least part of the matrix material selected from porous SiO<sub>2</sub>, zeolites, and porous polymers, e.g., ion exchange resins and adsorbents. The reticulated ceramic particles are used as chromatog. medium, catalysts, and adsorbents. The reticulated ceramic particles provided comprise SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, ZrO<sub>2</sub>, and Ru<sub>2</sub>O<sub>3</sub>.

L90 ANSWER 15 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1996:262939 HCAPLUS  
DOCUMENT NUMBER: 124:357137  
TITLE: Reactions of nanometric Pt layers  
on Si by HRTEM

AUTHOR(S): Conforto, E.; Schmid, P. E.

CORPORATE SOURCE: Inst. Phys. Appl., Ec. Polytechnique Lausanne,  
Lausanne, CH-1015, Switz.

SOURCE: Electron Microscopy 1994, Proceedings of the  
International Congress on Electron Microscopy, 13th,  
Paris, July 17-22, 1994 (1994), Volume 2A, 289-90.  
Editor(s): Jouffrey, Bernard; Colliex, C. Editions de  
Physique: Les Ulis, Fr.

CODEN: 62SHAV

DOCUMENT TYPE: Conference

LANGUAGE: English

AB The formation was studied of PtSi contact layers on Si by annealing sputtered Pt films. Silicon which was plasma etched before Pt deposition showed different surface resistances and surface morphologies of PtSi after growth. The best films are not epitaxial but polycryst. and are obtained at 550.degree..

L90 ANSWER 16 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1988:483940 HCAPLUS  
DOCUMENT NUMBER: 109:83940  
TITLE: Methods and apparatus for catalytic chemical vapor  
deposition

INVENTOR(S): Matsumura, Hideki

PATENT ASSIGNEE(S): Hiroshima University, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|-------------|------|----------|-----------------|----------|
| JP 63040314 | A2   | 19880220 | JP 1986-182827  | 19860805 |

PRIORITY APPLN. INFO.: JP 1986-182827 19860805

AB The title methods entail deposition at a substrate temp. between room temp. and 500.degree. with decompn. of a source gas which is brought into contact with a catalyst superheated at 800-2000.degree.. An amorphous, microcryst., or polycryst. Si, a Si-Ge, a SiC, a Si-Sn, an amorphous, polycryst., or microcryst. C, a Si<sub>3</sub>N<sub>4</sub>, a SiO<sub>2</sub>, a Si oxynitride, an Al<sub>2</sub>O<sub>3</sub>, an AlN, or an Al oxynitride film may be formed. The catalyst may be W, ThO<sub>2</sub>-contg. W, Pt, Pd, Mo, Si, Al<sub>2</sub>O<sub>3</sub>, SiC, or a metal-coated ceramic. The catalyst is maintained at a set temp. and the substrate is heated by radiation from the catalyst and a substrate heater. An amorphous Si film was deposited at 300.degree. and

>10 .ANG./s from SiH<sub>2</sub>F<sub>2</sub>-H<sub>2</sub> using a 2% ThO<sub>2</sub>-W catalyst maintained at 1400.degree. in surface temp. The film had a photocond.-to-dark cond. ratio of 104. No plasma damage was seen in the film.

L90 ANSWER 17 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1988:141622 HCAPLUS

DOCUMENT NUMBER: 108:141622

TITLE: Highly temperature-stable **silicon nitride** perforated grids

AUTHOR(S): Zandbergen, H. W.; Pruymboom, A.; Van Tendeloo, G.

CORPORATE SOURCE: Gorlaeus Lab., State Univ. Leiden, Leiden, 2300 RA, Neth.

SOURCE: Ultramicroscopy (1988), 24(1), 45-8

CODEN: ULTRD6; ISSN: 0304-3991

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Perforated Si<sub>3</sub>N<sub>4</sub> membranes on Pt grids were prep'd. by sputtering Si<sub>3</sub>N<sub>4</sub> on C-coated holey Triafol films. The latter were removed by heating slowly to 500.degree.. The combination of Si<sub>3</sub>N<sub>4</sub> membranes on Pt grids were stable up to 1000.degree. at which temp. a good attachment of Si<sub>3</sub>N<sub>4</sub> to the Pt grid was still retained. As an example, in-situ heating of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> (a new high T<sub>c</sub> superconductor) in the electron microscope and in a furnace at 450.degree. are compared.

L90 ANSWER 18 OF 38 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1986:540563 HCAPLUS

DOCUMENT NUMBER: 105:140563

TITLE: Specimen preparation technique for high resolution transmission electron **microscopy** studies on model supported metal catalysts

AUTHOR(S): Jacobs, J. W. M.; Verhoeven, J. F. C. M.

CORPORATE SOURCE: Philips Res. Lab., Eindhoven, 5600 JA, Neth.

SOURCE: Journal of Microscopy (Oxford, United Kingdom) (1986), 143(1), 103-16

CODEN: JMICAR; ISSN: 0022-2720

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A new technique is described which can be used for prepg. TEM specimens suitable for high-resoln. studies on supported metal catalysts. By conventional Si-processing techniques, Si<sub>3</sub>N<sub>4</sub> membranes on Si wafers were produced. These membranes are extremely flat with a uniform thickness of 13 nm. A TiO<sub>2</sub> film, optimally structured with respect to the requirements for high resoln. TEM work in TiO<sub>2</sub>-metal cluster systems, was deposited on the Si<sub>3</sub>N<sub>4</sub> layer. It consists of 1 monolayer of 10-25 nm TiO<sub>2</sub> crystallites. TiO<sub>2</sub> lattice images show that a line resoln. .gtoreq.0.19 nm is possible. Examples of TiO<sub>2</sub>-Pd and TiO<sub>2</sub>-Rh were prep'd. by using, resp., photodeposition and impregnation redn. to produce 1.5-4 nm metal clusters.

L90 ANSWER 19 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI

ACCESSION NUMBER: 2003:139079 SCISEARCH

THE GENUINE ARTICLE: 640FY

TITLE: Pd/SiO<sub>2</sub> catalysts: synthesis of Pd nanoparticles with the controlled size in mesoporous **silicas**

AUTHOR: Yuranov I; Moeckli P; Suvorova E; Buffat P; Kiwi-Minsker L (Reprint); Renken A

CORPORATE SOURCE: Swiss Fed Inst Technol, LGRC, CH-1015 Lausanne, Switzerland (Reprint); Swiss Fed Inst Technol, LC, DMX, CH-1015 Lausanne, Switzerland; Swiss Fed Inst Technol, CIME, CH-1015 Lausanne, Switzerland

COUNTRY OF AUTHOR: Switzerland  
SOURCE: JOURNAL OF MOLECULAR CATALYSIS A-CHEMICAL, (3 FEB 2003)  
Vol. 192; No. 1-2, pp. 239-251.  
Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE  
AMSTERDAM, NETHERLANDS.  
ISSN: 1381-1169.  
DOCUMENT TYPE: Article; Journal  
LANGUAGE: English  
REFERENCE COUNT: 60

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Synthesis of Pd nanoparticles with controlled size ( $d(\text{Pd}) = 1-3.6 \text{ nm}$ ) was carried out within the pores of the mesoporous HMS and SBA-15 silicas. Pd was ion-exchanged on non-calcined silicas, prepared by solvent extraction of the templates. A high concentration of silanol groups on the mesopore surface allowed attaining Pd loading up to 4.4. wt.%. The Pd /HMS and Pd/SBA-15 were characterised by chemical analysis, XRD,  $\text{N}_2$  adsorption-desorption and transmission electron microscopy (TEM) methods. The materials possess a high SSA and narrow pore size distribution. Introduction of Pd nanoparticles in HMS resulted in a progressive loss of the regularity in the mesoporous structure. On the contrary, all Pd/SBA-15 composites retained the original well-ordered 2D hexagonal structure of SBA-15. The thick walls of the SBA-15 framework are accounted for the higher stability observed. The TEM investigations confirmed that the Pd nanocrystals were located within the SBA-15 mesoporous framework channels. The particle size did not exceed the mesopore diameter (2-6 nm) at Pd loading of 0.1-4.4wt.%. Pd clusters were found to be resistant against sintering during air-calcination (550 degreesC, 4h). The catalyst 2.1% Pd/SBA-15 used in methane combustion at 520 degreesC demonstrated stable activity during 6h on stream. (C) 2002 Elsevier Science B.V. All rights reserved.

L90 ANSWER 20 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI  
ACCESSION NUMBER: 2002:885848 SCISEARCH  
THE GENUINE ARTICLE: 608NA  
TITLE: The ruthenium catalysed  
synthesis of carbon nanostructures  
AUTHOR: Mabudafhasi M L; Bodkin R; Nicolaides C P; Liu X Y;  
Witcomb M J; Coville N J (Reprint)  
CORPORATE SOURCE: Univ Witwatersrand, Sch Chem, Inst Mol Sci, ZA-2050 Wits,  
South Africa (Reprint); Univ Witwatersrand, Electron  
Microscope Unit, ZA-2050 Wits, South Africa  
COUNTRY OF AUTHOR: South Africa  
SOURCE: CARBON, (28 NOV 2002) Vol. 40, No. 14, pp. 2737-2742.  
Publisher: PERGAMON-ELSEVIER SCIENCE LTD, THE BOULEVARD,  
LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, ENGLAND.  
ISSN: 0008-6223.  
DOCUMENT TYPE: Article; Journal  
LANGUAGE: English  
REFERENCE COUNT: 16

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Reaction of propene over silica-, alumina- or titania-supported Ru catalysts in a tubular quartz flow reactor at moderate temperatures (500-700 degreesC). and atmospheric pressure produced Ru containing carbon nanofibres/tubes. TEM studies revealed that the fibres/tubes grew away from the support and contained Ru metal particles in their tips. The results indicate that sintering of the Ru during reduction with  $\text{H}_2$ , to a critical size not less than 30 nm, is required for fibre/tube formation. (C) 2002 Elsevier Science Ltd. All rights reserved.

L90 ANSWER 21 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI

ACCESSION NUMBER: 2002:478164 SCISEARCH

THE GENUINE ARTICLE: 558TQ

TITLE: **Synthesis and property of nanosized palladium catalysts protected by chitosan/silica**

AUTHOR: Huang A M; Liu Y F (Reprint); Chen L; Hua J D

CORPORATE SOURCE: Shanghai Univ, Dept Polymer Mat, Shanghai 201800, Peoples R China (Reprint)

COUNTRY OF AUTHOR: Peoples R China

SOURCE: JOURNAL OF APPLIED POLYMER SCIENCE, (1 AUG 2002) Vol. 85, No. 5, pp. 989-994.

Publisher: JOHN WILEY & SONS INC, 605 THIRD AVE, NEW YORK, NY 10158-0012 USA.

ISSN: 0021-8995.

DOCUMENT TYPE: Article; Journal

LANGUAGE: English

REFERENCE COUNT: 5

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB A chitosan (CTN)/silica-supported nanosized **palladium** catalyst was obtained from a silica-supported chitosan **palladium** complex through a complex transition method. An adsorption model was employed to simplify the structure of the di-supporter. It was indicated that when the polymer coil/adsorbed on the silica surface with even a monolayer the catalytic activity would reach an optimum value, and different situations of the, nanosized palladium particles would cause a different catalysis. The molar ratio of the chitosan structure unit to the **palladium** would affect the metal's size, which therefore influenced its catalytic activity. The experimental results corresponded with the inferences. (C) 2002 Wiley Periodicals, Inc. J Appl Polym Sci 85: 989-994, 2002.

L90 ANSWER 22 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI

ACCESSION NUMBER: 2002:300159 SCISEARCH

THE GENUINE ARTICLE: 535JF

TITLE: Enhancing the activity of fuel-cell reactions by designing three-dimensional **nanosized architectures: Catalyst-modified carbon-silica** composite aerogels

AUTHOR: Anderson M L; Stroud R M; Rolison D R (Reprint)

CORPORATE SOURCE: USN, Res Lab, Surface Chem Branch, Code 6170, Washington, DC 20375 USA (Reprint); USN, Res Lab, Surface Chem Branch, Washington, DC 20375 USA; USN, Res Lab, Surface Modification Branch, Washington, DC 20375 USA

COUNTRY OF AUTHOR: USA

SOURCE: NANO LETTERS, (MAR 2002) Vol. 2, No. 3, pp. 235-240.

Publisher: AMER CHEMICAL SOC, 1155 16TH ST, NW,

WASHINGTON, DC 20036 USA.

ISSN: 1530-6984.

DOCUMENT TYPE: Article; Journal

LANGUAGE: English

REFERENCE COUNT: 27

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB We have developed highly active electrocatalytic nanosized architectures constructed from carbon-silica composite aerogels in which the carbon is modified with nanoscopic electrocatalysts. Our procedure is general and can be applied to any preformed catalyst-modified carbon powder. The aerogel architecture locks in an electronic path through the carbon quest as well as a continuous, three-dimensional mesoporous transport path for fuel molecules, solvent, and ions. The

electrocatalytic activity for methanol oxidation at colloidal-Pt-modified carbon-silica composite aerogels increases by 4 orders of magnitude per gram of Pt over that at native Pt-modified carbon powder. Supported catalysts derived from direct adsorption of colloidal Pt too large to enter the micropores of the carbon are more active per gram of Pt than those prepared using impregnation techniques. A further improvement in mass-normalized activity is achieved by appropriately annealing (temperature and atmosphere) Pt-modified carbon-silica composite aerogels to increase the size of the supported Pt to >3 nm but <4 nm.

L90 ANSWER 23 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI

ACCESSION NUMBER: 2002:993233 SCISEARCH

THE GENUINE ARTICLE: BV62A

TITLE: **Synthesis and characterization of carbon nanofiber supported ruthenium catalysts**

AUTHOR: Toebe M L (Reprint); Prinsloo F F; Bitter J H; van Dillen A J; de Jong K P

CORPORATE SOURCE: Univ Utrecht, Debye Inst, Dept Inorgan Chem & Catalysis, POB 80083, NL-3508 TB Utrecht, Netherlands (Reprint); Univ Utrecht, Debye Inst, Dept Inorgan Chem & Catalysis, NL-3508 TB Utrecht, Netherlands; Sasol Technol R&D, ZA-9570 Sasolburg, South Africa

COUNTRY OF AUTHOR: Netherlands; South Africa

SOURCE: SCIENTIFIC BASES FOR THE PREPARATION OF HETEROGENEOUS CATALYSTS, (DEC 2002) Vol. 143, pp. 201-208.

Publisher: ELSEVIER SCIENCE BV, SARA BURGERHARTSTRAAT 25, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS.

ISSN: 0167-2991.

DOCUMENT TYPE: Article; Journal

LANGUAGE: English

REFERENCE COUNT: 19

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Homogeneous deposition precipitation (HDP) is explored for the preparation of carbon nanofiber supported ruthenium catalysts. First, carbon nanofibers (CNF, 177 m(2)/g) are oxidized using nitric acid thus activating the graphitic carbon surface. Second, ruthenium (hydr)oxide is deposited homogeneously onto the CNF by hydrolysis of urea at 363K.

Electron microscopy and hydrogen chemisorption studies showed that, after reduction in hydrogen, the CNF were readily homogeneously covered with 1-2 nm metal particles. This high dispersion remained almost unchanged upon heating in inert gas up to 973 K. These results clearly demonstrate the applicability of the HDP technique for the preparation of thermostable CNF-supported metal catalysts.

L90 ANSWER 24 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI

ACCESSION NUMBER: 2002:277966 SCISEARCH

THE GENUINE ARTICLE: 534BN

TITLE: **Synthesis of mesoporous silica with embedded nickel nanoparticles for catalyst applications**

AUTHOR: Leite E R (Reprint); Carreno N L V; Longo E; Valentini A; Probst L F D

CORPORATE SOURCE: UFSCar, Dept Chem, CMDMC LIEC, Via Washington Luiz, Km 235, CP 676, BR-13565905 Sao Carlos, SP, Brazil (Reprint); UFSCar, Dept Chem, CMDMC LIEC, BR-13565905 Sao Carlos, SP, Brazil; Univ Fed Santa Catarina, LABOCATH, Dept Chem, BR-88040900 Florianopolis, SC, Brazil

COUNTRY OF AUTHOR: Brazil  
SOURCE: JOURNAL OF NANOSCIENCE AND NANOTECHNOLOGY, (FEB 2002) Vol. 2, No. 1, pp. 89-94.  
Publisher: AMER SCIENTIFIC PUBLISHERS, 25650 NORTH LEWIS WAY, STEVENSON RANCH, CA 91381-1439 USA.  
ISSN: 1533-4880.  
DOCUMENT TYPE: Article; Journal  
LANGUAGE: English  
REFERENCE COUNT: 12

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Here we describe a new route for the synthesis of nanometric Ni particles embedded in a mesoporous silica material with excellent potential for catalytic applications. Mesoporous silica with a surface area in the range of 202-280 m<sup>2</sup>/g, with narrow pore size distribution and Ni nanoparticles (particles in the range of 3-41 nm) were obtained in a direct process. A different approach was adopted to process such a nanocomposite. This new approach is based on the formation of a polymer with the silicon oxanion and nickel cation chelated to the macromolecule structure and on the control of the pyrolysis step. The CO/CO<sub>2</sub> atmosphere resulting from the pyrolysis of the organic material promotes the reduction of the Ni citrate.

L90 ANSWER 25 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI

ACCESSION NUMBER: 2001:699022 SCISEARCH

THE GENUINE ARTICLE: 464VE

TITLE: Temperature-programmed surface reaction study on C-2-oxygenate synthesis over SiO<sub>2</sub> and nanoporous zeolitic material supported Rh-Mn catalysts

AUTHOR: Ma H T; Yuan Z Y; Wang Y; Bao X H (Reprint)

CORPORATE SOURCE: Chinese Acad Sci, State Key Lab Catalysis, Dalian Inst Chem Phys, POB 110, Dalian 116023, Peoples R China (Reprint); Chinese Acad Sci, State Key Lab Catalysis, Dalian Inst Chem Phys, Dalian 116023, Peoples R China; Chinese Acad Sci, Inst Phys, Beijing Lab Electron Microscopy, Beijing 100080, Peoples R China; Chinese Acad Sci, Ctr Condensed Matter Phys, Beijing 100080, Peoples R China

COUNTRY OF AUTHOR: Peoples R China

SOURCE: SURFACE AND INTERFACE ANALYSIS, (AUG 2001) Vol. 32, No. 1, pp. 224-227.  
Publisher: JOHN WILEY & SONS LTD, BAFFINS LANE CHICHESTER, W SUSSEX PO19 1UD, ENGLAND.  
ISSN: 0142-2421.

DOCUMENT TYPE: Article; Journal

LANGUAGE: English

REFERENCE COUNT: 16

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Temperature-programmed surface reaction (TPSR), temperature-programmed reaction (TPR) and temperature-programmed desorption (TPD) were used to study the synthesis of C-2-oxygenates from syngas over Rh-Mn-based catalysts supported on amorphous silica and mesoporous MCM-41 supports. Both TPD and TPSR reveal the existence of several different kinds of CO species on the catalyst surface in the course of the catalytic reaction (linear, geminal, bridged and tilt-adsorbed CO species) but only the bridged form and tilt-adsorbed CO species are the precursors for CO dissociation and the formation of C-2-oxygenates. The formation temperature of acetaldehyde is higher than that of ethanol, which suggests that they may be formed via different mechanisms. The ethanol formation activity over the Rh-Mn/MCM-41 catalyst is lower than that over the Rh-Mn/SiO<sub>2</sub>, which suggests that the number of active sites



for ethanol formation are fewer on the surface of Rh-Mn/MCM-41. However, the acetaldehyde formation activities are almost identical for the Rh-Mn catalysts supported on amorphous SiO<sub>2</sub> and MCM-41, meaning that acetaldehyde and ethanol might be formed on different active sites. Copyright (C) 2001 John Wiley & Sons, Ltd.

L90 ANSWER 26 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI

ACCESSION NUMBER: 2000:321661 SCISEARCH

THE GENUINE ARTICLE: 306MD

TITLE: Foils, films, and **nanostuctured** surfaces: A comparative XPS and AFM study of model **catalyst** surfaces

AUTHOR: Schildenberger M; Prins R (Reprint); Bonetti Y C

CORPORATE SOURCE: ETH ZURICH, TECH CHEM LAB, CH-8092 ZURICH, SWITZERLAND (Reprint); ETH ZURICH, TECH CHEM LAB, CH-8092 ZURICH, SWITZERLAND; PAUL SCHERRER INST, LAB MICRO & NANOTECHNOL, CH-5232 VILLIGEN, SWITZERLAND

COUNTRY OF AUTHOR: SWITZERLAND

SOURCE: JOURNAL OF PHYSICAL CHEMISTRY B, (13 APR 2000) Vol. 104, No. 14, pp. 3250-3260.

Publisher: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036.

ISSN: 1089-5647.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: PHYS

LANGUAGE: English

REFERENCE COUNT: 22

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB A polycrystalline **palladium** foil and **palladium** films of various thickness, supported on oxidized silicon wafers, were treated under catalytic conditions in a gas-flow reactor. Their topography and chemical composition were investigated before and after exposure to oxygen and hydrogen by atomic force microscopy and X-ray photoelectron spectroscopy. The results were compared with those of nanostructured palladium model catalysts measured under the same conditions. The nanostructured samples were prepared on oxidized silicon wafers by laser interference lithography and subsequent metal evaporation. Hydrogen and carbon monoxide oxidation were used as test reactions in a quartz reactor at 1 atm pressure and at temperatures up to 600 degrees C. All **palladium**-containing systems were catalytically active after several activation cycles. Nanostructured silver model catalysts were treated in the same way for comparison. The high-temperature treatment at atmospheric pressures in oxygen and hydrogen proved to be highly effective in decontaminating the surface of the catalysts and especially in ridding it of carbon-containing species. Significant changes in the topography of the metal surfaces due to catalytic etching were observed after treatments at 400 and 600 degrees C in the presence of oxygen and hydrogen. While larger **palladium** clusters on the flat SiO<sub>2</sub> surface tended to sinter and form larger aggregates, the silver particles started to split and spread over the substrate.

L90 ANSWER 27 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI

ACCESSION NUMBER: 2000:178600 SCISEARCH

THE GENUINE ARTICLE: 287XT

TITLE: **Fabrication** and characterization of the Ag-based high-technology model **nanocluster catalyst** for ethylene epoxidation manufactured by electron beam lithography

AUTHOR: Avoyan A (Reprint); Rupprechter G; Eppler A S; Somorjai G A

CORPORATE SOURCE: UNIV CALIF BERKELEY, DEPT CHEM, BERKELEY, CA 94720  
(Reprint); UNIV CALIF BERKELEY, LAWRENCE BERKELEY LAB, DIV  
MAT SCI, BERKELEY, CA 94720

COUNTRY OF AUTHOR: USA

SOURCE: TOPICS IN CATALYSIS, (JUN 2000) Vol. 10, No. 1-2, pp.  
107-113.  
Publisher: BALTZER SCI PUBL BV, PO BOX 221, 1400 AE  
BUSSUM, NETHERLANDS.  
ISSN: 1022-5528.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: PHYS

LANGUAGE: English

REFERENCE COUNT: 14

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Nanocluster catalysis is an area where greater fundamental knowledge is needed to understand the behavior of aggregates of metal atoms in determining product selectivity of chemical reactions. While catalysis is practiced industrially with economic success there is still a great need to eliminate wasteful side-reactions which hurt overall yields. Here we report on fabrication of a Ag-based high-technology model nanocluster catalyst by using electron beam lithography (EBL) designed for systematic studies of the ethylene epoxidation reaction. The catalyst is made of a square array of cylinder-shaped Ag nanoclusters that are 200 Angstrom in diameter, deposited on a four inch silicon wafer, precovered with a 100 Angstrom thick film of alpha-alumina. The height of the particles and interparticle distance can vary, and were chosen to be 150-300 and 1000 Angstrom, respectively. The high technology catalyst was characterized by X-ray photoelectron spectroscopy (XPS), high-resolution transmission electron microscopy (TEM), scanning electron microscopy (SEM), and atomic force microscopy (AFM). The thermal stability of Ag nanoclusters in vacuo was investigated.

L90 ANSWER 28 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI

ACCESSION NUMBER: 2000:468775 SCISEARCH

THE GENUINE ARTICLE: 325YJ

TITLE: Model catalysts fabricated by electron beam lithography: AFM and TPD surface studies and hydrogenation/dehydrogenation of cyclohexene plus H-2 on a Pt nanoparticle array supported by silica

AUTHOR: Eppler A S; Zhu J; Anderson E A; Somorjai G A (Reprint)

CORPORATE SOURCE: UNIV CALIF BERKELEY, DEPT CHEM, BERKELEY, CA 94720  
(Reprint); UNIV CALIF BERKELEY, DEPT CHEM, BERKELEY, CA 94720;  
UNIV CALIF BERKELEY, LAWRENCE BERKELEY LAB, DIV MAT SCI, BERKELEY, CA 94720

COUNTRY OF AUTHOR: USA

SOURCE: TOPICS IN CATALYSIS, (JUN 2000) Vol. 13, No. 1-2, pp.  
33-41.  
Publisher: BALTZER SCI PUBL BV, PO BOX 221, 1400 AE  
BUSSUM, NETHERLANDS.  
ISSN: 1022-5528.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: PHYS

LANGUAGE: English

REFERENCE COUNT: 21

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Pt nanoparticle model catalysts with 28 +/- 2 nm diameters and 100 +/- 2 nm square periodicity have been fabricated with electron beam lithography on silica substrates. The reactivity of the Pt/SiO2 arrays was compared to a Pt foil for cyclohexene + H-2 at 100 degrees C. The overall reactivity of the Pt

particle arrays was higher by a factor of two, the selectivity towards dehydrogenation was three times higher, and the rate of deactivation was about the same as for the Pt foil. Since the primary difference between the nanoparticle array and the Pt foil was the interface between the Pt and the SiO<sub>2</sub>, the interfacial region was most likely responsible for the changes in reactivity on the arrays. Using AFM, SEM, and TPD, the arrays were characterized before and after being exposed to reaction conditions. AFM images of a sample cleaned by ion sputtering showed that the pattern of the Pt nanoparticle array was replicated in the silica during the sputtering process.

L90 ANSWER 29 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI  
ACCESSION NUMBER: 1998:213813 SCISEARCH  
THE GENUINE ARTICLE: ZA934  
TITLE: The preparation and characterisation of nanometre  
platinum colloids on silicon  
wafers as model catalysts  
AUTHOR: Chen Z X; Smith G C (Reprint); Putman C A J; terVoert E J  
M  
CORPORATE SOURCE: SHELL RES & TECHNOL CTR THORNTON, POB 1, CHESTER CH1 3SH,  
CHESHIRE, ENGLAND (Reprint); SHELL INT OIL PROD BV,  
NL-1030 BN AMSTERDAM, NETHERLANDS; SHELL INT CHEM BV,  
NL-1030 BN AMSTERDAM, NETHERLANDS; SHELL RES & TECHNOL CTR  
AMSTERDAM, NL-1030 BN AMSTERDAM, NETHERLANDS  
COUNTRY OF AUTHOR: ENGLAND; NETHERLANDS  
SOURCE: CATALYSIS LETTERS, (FEB 1998) Vol. 50, No. 1-2, pp. 49-57.  
Publisher: BALTZER SCI PUBL BV, PO BOX 221, 1400 AE  
BUSSUM, NETHERLANDS.  
ISSN: 1011-372X.  
DOCUMENT TYPE: Article; Journal  
FILE SEGMENT: PHYS; ENGI  
LANGUAGE: English  
REFERENCE COUNT: 14

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Platinum particles of 2 nm diameter have been immobilised on  
oxidised silicon wafers by spin coating with colloidal solutions  
and characterised by X-ray photoelectron spectroscopy (XPS) and atomic  
force microscopy (AFM). The coverage and dispersion of the Pt  
colloids on the Si wafer are controlled by varying the concentration and  
the spin speed. Under optimal conditions monodispersed Pt  
colloids on silicon wafers are prepared. For the Pt  
colloids immobilised on the Si wafer, the majority of the stabilising  
ligands are removed through a reduction (with H-2 at 200 degrees C) or an  
oxidation (in air at 300 degrees C) procedure. AFM showed that particle  
sizes are retained after the reduction procedure, while significant  
sintering occurs after oxidation. The mechanism of ligand removal was  
studied using an in situ XPS reaction cell.

L90 ANSWER 30 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI  
ACCESSION NUMBER: 97:558991 SCISEARCH  
THE GENUINE ARTICLE: XL821  
TITLE: Nanostructural evolution of a Pt/CeO<sub>2</sub>  
catalyst reduced at increasing temperatures  
(473-1223 K): A HREM study  
AUTHOR: Bernal S (Reprint); Calvino J J; Gatica J M; Larese C;  
LopezCartes C; PerezOmil J A  
CORPORATE SOURCE: UNIV CADIZ, FAC CIENCIAS, DEPT CIENCIA MAT & INGN MET &  
QUIM INORGAN, APARTADO 40, PUERTO REAL 11510, CADIZ, SPAIN  
(Reprint)  
COUNTRY OF AUTHOR: SPAIN  
SOURCE: JOURNAL OF CATALYSIS, (15 JUL 1997) Vol. 169, No. 2, pp.

510-515.

Publisher: ACADEMIC PRESS INC JNL-COMP SUBSCRIPTIONS, 525  
B ST, STE 1900, SAN DIEGO, CA 92101-4495.

ISSN: 0021-9517.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: PHYS; ENGI

LANGUAGE: English

REFERENCE COUNT: 25

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Experimental HREM combined with computer simulation, digital image processing, and SAED techniques have been fruitfully applied to the nanostructural characterization of a Pt/CeO<sub>2</sub> catalyst reduced at temperatures ranging from 473 to 1223 K. Metal decoration effects were detected upon reduction at 973 K. Alloying phenomena could be observed only at the highest reduction temperatures. The crystallographic analysis of the HREM images shows that CePt<sub>5</sub> is the only intermetallic phase present in the catalyst. Likewise, preferential orientation relationships were observed in the growth of the alloy microcrystals on ceria. (C) 1997 Academic Press.

L90 ANSWER 31 OF 38 SCISEARCH COPYRIGHT 2003 THOMSON ISI

ACCESSION NUMBER: 97:866494 SCISEARCH

THE GENUINE ARTICLE: YG448

TITLE:

New model catalysts (  
platinum nanoparticles) and new  
techniques (SFG and STM) for studies of reaction  
intermediates and surface restructuring at high pressures  
during catalytic reactions

AUTHOR: Somorjai G A (Reprint)

CORPORATE SOURCE: UNIV CALIF BERKELEY, DEPT CHEM, BERKELEY, CA 94720  
(Reprint); LAWRENCE BERKELEY NATL LAB, DIV SCI MAT,  
BERKELEY, CA

COUNTRY OF AUTHOR: USA

SOURCE: APPLIED SURFACE SCIENCE, (NOV 1997) Vol. 121, pp. 1-19.

Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE  
AMSTERDAM, NETHERLANDS.

ISSN: 0169-4332.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: PHYS; ENGI

LANGUAGE: English

REFERENCE COUNT: 41

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Single-crystal surfaces have long served us well as model catalysts;  
however, a new type of model catalyst has been prepared using electron  
beam lithography. Ordered arrays of platinum nano-particles in  
the 2.5-50 nm size range are deposited on oxide substrates (silica  
, alumina, and titania) of 1 cm<sup>2</sup> surface area, and are used in catalyzed  
surface reactions at high pressures (atmospheres). Their preparation,  
cleaning, and reactivity is discussed. Scanning tunneling microscopy (STM)  
and vibrational spectroscopy by sum frequency generation (SFG) can be  
utilized to monitor the substrate and adsorbate structure, respectively,  
over a fourteen order of magnitude pressure range (10<sup>-10</sup>-10<sup>-4</sup> Torr). As  
a consequence, we can monitor the surface structure and reaction  
intermediates during high pressure catalytic reactions. An STM that  
operates at both high pressure (atmosphere) and high temperature has been  
constructed and utilized to monitor platinum (111) and (110)  
surface structure during chemisorption of H<sub>2</sub>, O<sub>2</sub> and CO, and during  
catalytic reactions of olefin hydrogenation and hydrogenolysis. Changes of  
surface structure upon chemisorption and during reactions have been  
monitored. Catalysis by the platinum tip was also detected in  
the presence of H<sub>2</sub> or O<sub>2</sub> at high pressures and 300 K, leading to

hydrogenation or oxidation of carbonaceous deposits with nanometer spatial resolution. Vibrational spectroscopy using SFG has been used to monitor pressure dependent changes in the chemisorption of CO and NO over Pt(111). Bonding which is similar to that in Pt-m(CO)(n) (where  $n/m > 1$ ) clusters and for an incommensurate CO overlayer - is observed above 100 Torr. Reaction intermediates that form during ethylene, propylene, and isobutene hydrogenation, as well as CO oxidation, at atmospheric pressures and 300 K were monitored by SFG. The dominant reacting species that hydrogenate are the weakly pi-bonded olefins, while the strongly chemisorbed alkylidyne and di-cr bonded species are spectators during the reaction. From quantitative measurement of coverages, the absolute turnover rates can be determined. (C) 1997 Elsevier Science B.V.

L90 ANSWER 32 OF 38 WPIX (C) 2003 THOMSON DERWENT

ACCESSION NUMBER: 2002-224976 [28] WPIX

DOC. NO. NON-CPI: N2002-172418

DOC. NO. CPI: C2002-068599

TITLE: Metal nano-particles or fibers formation used in catalysis, involves mixing carbon nano-tubes and/or carbon nano-fibers with metal salt and heating resulting mixture in reducing gas or inert gas atmosphere.

DERWENT CLASS: M22 P53

INVENTOR(S): CHEN, P; LIN, J; TAN, K L; WU, X; XUE, B

PATENT ASSIGNEE(S): (CHEN-I) CHEN P; (LINJ-I) LIN J; (TANK-I) TAN K L; (WUXX-I) WU X; (XUEB-I) XUE B

COUNTRY COUNT: 1

PATENT INFORMATION:

| PATENT NO  | KIND | DATE     | WEEK      | LA | PG |
|------------|------|----------|-----------|----|----|
| US 6346136 | B1   | 20020212 | (200228)* |    | 10 |

APPLICATION DETAILS:

| PATENT NO  | KIND | APPLICATION    | DATE     |
|------------|------|----------------|----------|
| US 6346136 | B1   | US 2000-539783 | 20000331 |

PRIORITY, APPLN. INFO: US 2000-539783 20000331

AB US 6346136 B UPAB: 20020502

NOVELTY - Carbon nano-tubes and/or carbon nano-fibers are mixed with at least one metal salt to form a mixture. The mixture is heated in a reducing gas or inert gas atmosphere to obtain metal nano-particles or metal sub-micron fibers.

USE - For **synthesis** of metal nano-particles and fibers, such as copper, **palladium**, **platinum**, silver or gold nano-particles and copper sub-micron fibers, used in catalysis, electrical and optical devices and coatings.

ADVANTAGE - Enables formation of metal nano-particles and sub-micron fibers, such that the metal particles do not stick strongly to nano-tubes and can be easily separated from nano-tubes by ultrasonic treatment. The carbon nano-tubes or nano-fibers is formed by catalytic disproportionation of carbon monoxide (CO) of carbon nano-tubes or catalytic decomposition of methane on a nickel or Co-based catalyst, hence 75 % or more of product is in form of nano-tubes or nano-fibers, after purification. The structural properties of graphene layers in carbon nano-tubes and carbon nano-fibers are similar to those of graphite, with greater inter layer distance.

Dwg.0/6

L90 ANSWER 33 OF 38 WPIX (C) 2003 THOMSON DERWENT

ACCESSION NUMBER: 2003-159988 [16] WPIX

DOC. NO. NON-CPI: N2003-126257

DOC. NO. CPI: C2003-042037

TITLE: Hydrogen storage and supply system comprises raw material storage unit, reactor having metal supported **catalyst**, raw material supply unit, vapor-liquid separation unit and reaction material recovering unit.

DERWENT CLASS: E14 E36 J04 J06 L03 Q69 X16

PATENT ASSIGNEE(S): (DENS-N) DENSEI KK; (ICHI-I) ICHIKAWA K; (SEKI) SEKISUI CHEM IND CO LTD

COUNTRY COUNT: 1

PATENT INFORMATION:

| PATENT NO     | KIND | DATE     | WEEK      | LA | PG |
|---------------|------|----------|-----------|----|----|
| JP 2002274802 | A    | 20020925 | (200316)* |    | 10 |

APPLICATION DETAILS:

| PATENT NO     | KIND | APPLICATION   | DATE     |
|---------------|------|---------------|----------|
| JP 2002274802 | A    | JP 2001-69661 | 20010313 |

PRIORITY APPLN. INFO: JP 2001-69661 20010313

AB JP2002274802 A UPAB: 20030307

NOVELTY - Hydrogen storage and supply system comprises raw material storage unit (2), reactor (4), raw material supply unit (3), vapor-liquid separation unit (5) and reaction material recovering unit (8). Reactor accommodates metal supported **catalyst** (41). Hydrogen supply component or hydrogen storage component forms coexisting boundary surface of gaseous phase and liquid phase in reactor.

DETAILED DESCRIPTION - The hydrogen storage and supply system comprises the raw material storage unit (2), reactor (4), raw material supply unit (3), vapor-liquid separation unit (5) and a reaction material recovering unit (8). The hydrogen storage and supply system performs storage and/or supply of hydrogen using at least one hydrogenation reaction of the hydrogen storage component containing an aromatic compound and dehydrogenation of the hydrogen supply component containing the hydrogenated derivative of the aromatic compound. The raw material storage unit accommodates hydrogen storage components and/or hydrogen supply components. The reactor accommodates the metal supported **catalyst** (41) which causes hydrogenation of the hydrogen storage components and/or dehydrogenation of hydrogen supply component. The raw material supply unit supplies hydrogen supply component to the hydrogen storage component within the raw material storage unit and/or to the reactor. The vapor-liquid separation unit condenses and separates hydrogen from the formation gas from the reactor, hydrogen storage component and/or hydrogen supply component. The reaction material recovering unit collects separated hydrogen storage component and/or hydrogen supply component. The hydrogen supply component or hydrogen storage component forms a coexisting boundary surface of a gaseous phase and a liquid phase in the reactor having cylindrical form.

USE - Used as hydrogen storage and supply system e.g. as fuel cell system.

ADVANTAGE - The hydrogen storage and supply system supplies hydrogen stably and efficiently. The system is inexpensive and performs hydrogenation and dehydrogenation efficiently.

DESCRIPTION OF DRAWING(S) - The figure shows an explanatory drawing

showing the composition of hydrogen storage and supply system. (Drawing includes non-English language text).

Raw material storage unit 2  
Raw material supply unit 3  
Reactor 4  
Vapor-liquid separation unit 5  
Reaction material recovering unit 8  
Controller 10  
**Catalyst 41**  
Dwg.1/3

L90 ANSWER 34 OF 38 WPIX (C) 2003 THOMSON DERWENT

ACCESSION NUMBER: 2001-609425 [70] WPIX

DOC. NO. NON-CPI: N2001-455061

DOC. NO. CPI: C2001-181568

TITLE: Metal supported **catalyst**, for hydrogen supply and storage system, has metal(s) of nickel, **palladium, platinum, rhodium, iridium, ruthenium**, molybdenum, rhenium, tungsten, vanadium, osmium, chrome, cobalt and/or iron.

DERWENT CLASS: E36 J04 Q69 X16

PATENT ASSIGNEE(S): (ICHI-I) ICHIKAWA K; (SEKI) SEKISUI CHEM IND CO LTD

COUNTRY COUNT: 1

PATENT INFORMATION:

| PATENT NO       | KIND | DATE     | WEEK      | LA | PG |
|-----------------|------|----------|-----------|----|----|
| JP 2001198469 A |      | 20010724 | (200170)* |    | 11 |

APPLICATION DETAILS:

| PATENT NO       | KIND | APPLICATION    | DATE     |
|-----------------|------|----------------|----------|
| JP 2001198469 A |      | JP 2000-336092 | 20001102 |

PRIORITY APPLN. INFO: JP 1999-315456 19991105

AB JP2001198469 A UPAB: 20011129

NOVELTY - A metal supported **catalyst** (K) has catalytic activity during hydrogenation of hydrogen storage unit which has aromatic compound, and dehydrogenation of hydrogen supply unit which contains hydrogenated derivative of the aromatic compound. The **catalyst** comprises metal(s) of nickel, **palladium, platinum, rhodium, iridium, ruthenium**, molybdenum, rhenium, tungsten, vanadium, osmium, chromium, cobalt and/or iron.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for hydrogen storage and supply system which performs storage and supply of hydrogen by hydrogenation of hydrogen storage unit and dehydrogenation of hydrogen supply unit.

USE - For hydrogen storage and supply system (claimed) for fuel cells, used in residence.

ADVANTAGE - The hydrogenation of aromatic compound and dehydrogenation of hydrogenated derivative of aromatic compound are performed stably and efficiently within a single container. The metal supported **catalyst** comprising specific active metal accelerates reversible hydrogenation and dehydrogenation of aromatic compound.

DESCRIPTION OF DRAWING(S) - The figure shows the explanatory drawing of hydrogen storage supply system.

Storage part 1

Reaction container 2

Product feed zone 3

Gas separation part 4  
Recovery part 5  
Hydrogen feed zone 6  
Dwg.1/3

L90 ANSWER 35 OF 38 WPIX (C) 2003 THOMSON DERWENT  
ACCESSION NUMBER: 1999-519197 [44] WPIX  
DOC. NO. CPI: C1999-151862  
TITLE: Method for **preparation** openside  
**nanometre** carbon tube - comprises uniform mixing  
of carbon source with **catalyst** in the gas phase  
with feeding of reactant mixture to reactor at constant  
speed.  
DERWENT CLASS: E36 J04 L02 U11  
INVENTOR(S): CHENG, H; FAN, Y; LI, F  
PATENT ASSIGNEE(S): (META-N) METAL INST CHINESE ACAD SCI  
COUNTRY COUNT: 1  
PATENT INFORMATION:

| PATENT NO  | KIND | DATE     | WEEK      | LA | PG |
|------------|------|----------|-----------|----|----|
| CN 1221048 | A    | 19990630 | (199944)* |    | 1  |

## APPLICATION DETAILS:

| PATENT NO  | KIND | APPLICATION    | DATE     |
|------------|------|----------------|----------|
| CN 1221048 | A    | CN 1997-119825 | 19971225 |

PRIORITY APPLN. INFO: CN 1997-119825 19971225

AB CN 1221048 A UPAB: 19991026

A process for preparing single-wall nm-class carbon tubes includes uniformly mixing carbon source with catalyst in gas state and feeding the mixture into reaction region at constant speed. The carbon source is low-melting-point hydrocarbon of water molecule with less than 10 carbon atoms. The diluting gas is hydrogen, argon or nitrogen. The mol ratio of carbon source to diluting gas is 0.5-5. The catalyst may be an organic compound of Fe, **Pt** or Ni. The mol ratio of catalyst to carbon source is 1 : (10-20). The initial temperature of carbon source, final reaction temperature, temperature raising speed and temperature constant time are 400-500 deg. C, 1050-1250 deg. C, 20-30 deg. C/min and 0.5-2 hr for Fe or **Pt** as catalyst, or 250-350 deg. C, 600-800 deg. C, 20-30 deg. C/min and 0.5-2 hr for Ni as catalyst.  
Dwg.0/0

L90 ANSWER 36 OF 38 WPIX (C) 2003 THOMSON DERWENT  
ACCESSION NUMBER: 1998-008634 [01] WPIX  
DOC. NO. CPI: C1998-003030  
TITLE: **Catalyst** comprising nanoparticles of  
**palladium** on refractory support of gamma-alumina  
- is made by physical **vapour** deposition onto  
support cooled to limit metal atom mobility.  
DERWENT CLASS: E36 J04 L02 M13  
INVENTOR(S): KOCH, T A; SHAH, S I U  
PATENT ASSIGNEE(S): (DUPO) DU PONT DE NEMOURS & CO E I  
COUNTRY COUNT: 76  
PATENT INFORMATION:

| PATENT NO | KIND | DATE | WEEK | LA | PG |
|-----------|------|------|------|----|----|
|-----------|------|------|------|----|----|



WO 9743042 A1 19971120 (199801)\* EN 12  
RW: AT BE CH DE DK EA ES FI FR GB GH GR IE IT KE LS LU MC MW NL OA PT  
SD SE SZ UG  
W: AL AM AU AZ BA BB BG BR BY CA CN CU CZ EE GE HU IL IS JP KG KP KR  
KZ LC LK LR LT LV MD MG MK MN MX NO NZ PL RO RU SG SI SK TJ TM TR  
TT UA US UZ VN YU  
AU 9737155 A 19971205 (199814)  
EP 902728 A1 19990324 (199916) EN  
R: DE ES FR GB IT NL  
JP 2000510042 W 20000808 (200043) 16

## APPLICATION DETAILS:

| PATENT NO       | KIND | APPLICATION    | DATE     |
|-----------------|------|----------------|----------|
| WO 9743042      | A1   | WO 1997-US7793 | 19970507 |
| AU 9737155      | A    | AU 1997-37155  | 19970507 |
| EP 902728       | A1   | EP 1997-933987 | 19970507 |
|                 |      | WO 1997-US7793 | 19970507 |
| JP 2000510042 W |      | JP 1997-540943 | 19970507 |
|                 |      | WO 1997-US7793 | 19970507 |

## FILING DETAILS:

| PATENT NO       | KIND        | PATENT NO  |
|-----------------|-------------|------------|
| AU 9737155      | A Based on  | WO 9743042 |
| EP 902728       | A1 Based on | WO 9743042 |
| JP 2000510042 W | Based on    | WO 9743042 |

PRIORITY APPLN. INFO: US 1996-19085 19960514

AB WO 9743042 A UPAB: 19980107

A catalyst composition comprises a nanoparticulate catalytically active metal on a refractory support. Also claimed is a process for preparing the above composition by the physical vapour deposition of the active metal by sputtering onto a refractory support which has been cooled such that the deposited metal atoms have limited mobility.

Also claimed is a process for the reduction of anthraquinones to anthrahydroquinones in the preparation of hydrogen peroxide by hydrogenation, wherein the above catalyst is used as the hydrogenation catalyst to prepare hydrogen peroxide.

ADVANTAGE - Cooling the support during deposition restricts mobility diffusion to 2-3 atomic distances and enables the **preparation** of **nanoparticles** of <20 nm compared to about 0.1  $\mu$ m for **palladium** particles prepared by precipitation from solution; the finer particles are an order of magnitude more active than the precipitated particles.

Dwg.0/2

L90 ANSWER 37 OF 38 WPIX (C) 2003 THOMSON DERWENT

ACCESSION NUMBER: 1997-320288 [30] WPIX

DOC. NO. NON-CPI: N1997-265141

DOC. NO. CPI: C1997-103513

TITLE: **Preparing nanometre-particle nickel - palladium alloy catalyst.**

DERWENT CLASS: J04 M26 P54

INVENTOR(S): CUI, Z; DONG, L; ZHANG, Z

PATENT ASSIGNEE(S): (QING-N) QINGDAO COLLEGE CHEM ENG

COUNTRY COUNT: 1

PATENT INFORMATION:

| PATENT NO  | KIND | DATE     | WEEK      | LA | PG |
|------------|------|----------|-----------|----|----|
| CN 1105289 | A    | 19950719 | (199730)* |    | 2  |

## APPLICATION DETAILS:

| PATENT NO  | KIND | APPLICATION    | DATE     |
|------------|------|----------------|----------|
| CN 1105289 | A    | CN 1994-115078 | 19940829 |

PRIORITY APPLN. INFO: CN 1994-115078 19940829

AB CN 1105289 A UPAB: 19970723

The process for preparing nm-class NiPd alloy catalyst in special vacuum chamber with Ni and Pd, whose smelting points are close, includes such steps as putting Ni plate on anode plate, covering Pd sheet over Ni plate, heating while introducing-in argon, using Ni particles to touch for triggering electric arc, which evaporate Ni and Pd atoms which collide with each other to generate ultra-fine NiPd alloy particles deposited on cold trap, and collecting the catalyst product. The catalyst features high activity, low cost and high yield rate.

Dwg.0/0

L90 ANSWER 38 OF 38 WPIX (C) 2003 THOMSON DERWENT

ACCESSION NUMBER: 1994-156103 [19] WPIX

DOC. NO. CPI: C1994-071372

TITLE: Treatment of ammonia contg. water - by heating in presence of nitrite and catalyst comprising metal supported catalyst having carrier comprising at least one of alpha-alumina, titania and active carbon.

DERWENT CLASS: D15

PATENT ASSIGNEE(S): (KURK) KURITA WATER IND LTD

COUNTRY COUNT: 1

PATENT INFORMATION:

| PATENT NO   | KIND | DATE     | WEEK      | LA | PG |
|-------------|------|----------|-----------|----|----|
| JP 06099180 | A    | 19940412 | (199419)* |    | 3  |

## APPLICATION DETAILS:

| PATENT NO   | KIND | APPLICATION    | DATE     |
|-------------|------|----------------|----------|
| JP 06099180 | A    | JP 1992-252957 | 19920922 |

PRIORITY APPLN. INFO: JP 1992-252957 19920922

AB JP 06099180 A UPAB: 19940627

In a treatment of NH3 contg. water comprising heating in the presence of NO2(-) and a catalyst to decompose NH3, a metal supported catalyst having a carrier comprising at least one selected from alpha-alumina, titania and active C is used.

ADVANTAGE - Lowering of activity of the catalyst caused by stripping a catalyst metal off from the carrier does not occur and NH3 is decomposed in high efficiency for a long time.

In an example, to synthesise waste soln., pH 7, contg. 1500 mg/l of (NH4)2SO4 (based on NH4-N), NaNO2 was added in the concn. of 1500 mg/l (based on NO2-N) and the soln. was fed to a heating tank at SV of 10 hr-1. In the heating tank 10g of Pt supported

**catalyst** comprising a carrier of alpha-alumina supported with 0.5 wt.% of **Pt** was packed. The heating tank was kept at 140 deg. C and continuously operated for 1000 hrs. NH3 concn. in treated water was measured at intervals. The removing rate of NH3 obtd. from the measured concn. was over 80 %.

Dwg.0/0

=> file home

FILE 'HOME' ENTERED AT 17:02:49 ON 15 MAY 2003

09/805, 203

## WEST Search History

OLD

DATE: Wednesday, May 14, 2003

Set Name Query  
side by sideHit Count Set Name  
result set

DB=USPT,PGPB,JPAB,EPAB; THES=ASSIGNEE; PLUR=YES; OP=ADJ

|     |  |         |     |
|-----|--|---------|-----|
| L20 | L18 and L7   | 145     | L20 |
| L19 | L18 and L6   | 9       | L19 |
| L18 | L17 and L4   | 364     | L18 |
| L17 | L16 and L2   | 2301    | L17 |
| L16 | L15 and L1   | 3910    | L16 |
| L15 | (first layer) and (second layer) and (substrate or carrier or support)       | 41194   | L15 |
| L14 | L13 and L7   | 32      | L14 |
| L13 | L12 and L6   | 115     | L13 |
| L12 | L11 and L5   | 601     | L12 |
| L11 | L10 and L4   | 3855    | L11 |
| L10 | L8 and L9  | 66233   | L10 |
| L9  | oxid\$6  | 1004224 | L9  |
| L8  | L1 and L2 and L3   | 84581   | L8  |
| L7  | (bump near like) or protrusions or lump or bulge or projection or protrud\$4 | 931035  | L7  |
| L6  | overhang\$4  | 44515   | L6  |
| L5  | cluster\$4   | 70174   | L5  |
| L4  | anneal\$4  | 125917  | L4  |
| L3  | layer\$4   | 1770807 | L3  |
| L2  | polysilicon or silica or silicon   | 727447  | L2  |
| L1  | catalyst or initiator  | 460841  | L1  |

END OF SEARCH HISTORY

OLD Search use new one

09/805,20

040

## WEST Search History

DATE: Wednesday, May 14, 2003

Set Name Query  
side by sideHit Count Set Name  
result set

DB=USPT,PGPB,JPAB,EPAB; THES=ASSIGNEE; PLUR=YES; OP=ADJ

|     |  |         |     |
|-----|--|---------|-----|
| L20 | L18 and L7   | 145     | L20 |
| L19 | L18 and L6   | 9       | L19 |
| L18 | L17 and L4   | 364     | L18 |
| L17 | L16 and L2   | 2301    | L17 |
| L16 | L15 and L1   | 3910    | L16 |
| L15 | (first layer) and (second layer) and (substrate or carrier or support)       | 41194   | L15 |
| L14 | L13 and L7   | 32      | L14 |
| L13 | L12 and L6   | 115     | L13 |
| L12 | L11 and L5   | 601     | L12 |
| L11 | L10 and L4   | 3855    | L11 |
| L10 | L8 and L9  | 66233   | L10 |
| L9  | oxid\$6  | 1004224 | L9  |
| L8  | L1 and L2 and L3   | 84581   | L8  |
| L7  | (bump near like) or protrusions or lump or bulge or projection or protrud\$4 | 931035  | L7  |
| L6  | overhang\$4  | 44515   | L6  |
| L5  | cluster\$4   | 70174   | L5  |
| L4  | anneal\$4  | 125917  | L4  |
| L3  | layer\$4   | 1770807 | L3  |
| L2  | polysilicon or silica or silicon   | 727447  | L2  |
| L1  | catalyst or initiator  | 460841  | L1  |

END OF SEARCH HISTORY

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Problem Analysis and Search Strategy Worksheet

|  |   |  |                        |
|--|---|--|------------------------|
| Case Number-<br>Applicants   |   | Filing Date-<br>Assignee                     |                        |
|  |   |  |                        |
| Related US and foreign applications/docs                           |   | Publications applicant cited                 |                        |
|  |   |  |                        |
| US Classes and subclasses  |   | International classification                 |                        |
|  |   |  |                        |
| Concept A<br>CATALYST<br>OR.<br><del>INITIATOR</del><br>INITIATOR. | Concept B<br>POLYSILICON<br>OR<br>SILICA<br>OR<br>SILICON | Concept C<br><del>CATALYST</del><br>LAYER #4 | Concept D<br>ANNEAL #4 |
| Synonyms   | Synonyms  | Synonyms                                     | Synonyms               |
|  | OR  | OR   | OR                     |
| Databases  |   |  |                        |
| Commands, syntax, search statements for each database              |   |  |                        |
|  |   |  |                        |

09/805,203

# Problem Analysis and Search Strategy Worksheet

Case Number-  
Applicants

Filing Date-  
Assignee

Related US and foreign applications/docs

Publications applicant cited

US Classes and subclasses

International classification

Concept A

Concept B

Concept C

Concept D

CLUSTER#4

OVERHANG#4

NEAR  
BUMP LIKE  
OR  
PROTRUSIONS  
OR LUMP OR BULGE

OR#6

AND

AND

AND

Synonyms

Synonyms

Synonyms

Synonyms

hump or knob  
OR PROJECTION  
OR PROTRUDER  
#4

OR

OR

OR

Databases

Commands, syntax, search statements for each database